An Ecosystem Carbon Database for Canadian Forests

C.H. Shaw, J.S. Bhatti, and K.J. Sabourin

INFORMATION REPORT
NOR-X-403
NORTHERN FORESTRY CENTRE

Natural Resources Canada / Ressources naturelles Canada
Canadian Forest Service / Service canadien des forêts

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The Canadian Forest Service's Northern Forestry Centre is responsible for fulfilling the federal role in forestry research and technology transfer in Alberta, Saskatchewan, Manitoba, Nunavut, and the Northwest Territories. The main objective is research in support of improved forest management for the economic, social, and environmental benefit of all Canadians.

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Cover photograph: Mature black spruce forest near Nelson House, Manitoba, provided by Thierry Varem-Sanders

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ABSTRACT

The Forest Ecosystem Carbon Database presented in this report was compiled to meet the data needs of large-scale modelers and analysts working with the carbon budgets and dynamics of different forest ecosystems in Canada. The accompanying compact disk provides data for over 700 plots from across Canada, and includes data for over 60 variables. A summary of estimated carbon content for soil, tree biomass by component, and total ecosystem carbon for each plot is appended to this report. These estimates do not include detrital carbon (woody debris, etc.) or root biomass, which may significantly alter estimates for total ecosystem carbon in some forest types. The preliminary analyses in this report indicate that ecozones can be grouped on the basis of low and high average total biomass carbon and that these groups correspond to ecozones with low and high average total ecosystem carbon. Within each group of ecozones, mineral soil carbon contributes the highest proportion of carbon to the average total ecosystem carbon, and it is positively correlated with a gradient in ecozone climate from cold and dry to warm and wet. Differences between ecozones for the distribution of carbon within a mineral soil profile and variability in the carbon content of soil organic horizons may be explained by site-specific characteristics, such as differences in parent material and pedogenic processes.

RÉSUMÉ

La base de données sur les écosystèmes forestiers présentée dans ce rapport a été compilée afin de répondre aux besoins des spécialistes de la modélisation à grande échelle et des analystes s'intéressant aux bilans du carbone et à la dynamique des différents écosystèmes forestiers du Canada. Le disque compact s'y rattachant fournit des données sur plus de 700 placettes établies d'un bout à l'autre du Canada et présente des données sur plus de 60 variables. Un résumé des estimations des teneurs en carbone du sol et de la biomasse des arbres par composante ainsi que du carbone total de l'écosystème de chaque placette est annexé au rapport. Ces estimations ne comprennent pas le carbone présent dans les débris (débris ligneux, etc.) ou la biomasse des racines, des données qui pourraient modifier considérablement les estimations du carbone total de l'écosystème dans certains types forestiers. Selon les résultats des analyses préliminaires présentées dans ce rapport, les écozones peuvent être groupées à partir de la plus basse et la plus haute moyenne de carbone total de la biomasse, et ces groupes correspondent aux écozones ayant la plus basse et la plus haute moyenne de carbone total de l'écosystème. Au sein de chaque groupe d'écozones, le carbone du sol minéral est celui qui contribue le plus au carbone total moyen de l'écosystème, et cette contribution est positivement corrélée à un gradient du climat de l'écozone allant du froid et sec au chaud et humide. Les différences au niveau de la répartition du carbone dans un profil de sol minéral et la variabilité de la teneur en carbone des horizons du sol minéral d'une écozone à l'autre peuvent s'expliquer par les caractéristiques stationnelles, comme les différences de matériau d'origine et de processus pédogénétiques.

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PREFACE

This Forest Ecosystem Carbon Database (FECD) for Canada is the third of a series of three large-scale data collection and compilation projects completed by Canadian Forest Service staff at the Northern Forestry Centre in Edmonton. All three projects were developed to meet the data needs of large-scale ecosytem modelers and analysts, in particular those whose research is directed at understanding the response of forest carbon stocks and fluxes to changes in climate and site characteristics. The first two of these projects, the BOReal Ecosystem–Atmosphere Study (BOREAS) biometry and auxiliary sites (Halliwell and Apps 1997a, 1997b, 1997c) and a soil profile and organic carbon database for forest and tundra soils (Siltanen et al. 1997), were conceived by and supported through research funding to Dr. Mike Apps, who also strongly influenced and supported the development of the current database. The first project was published as three reports (Halliwell and Apps 1997a, 1977b, 1977c) providing basic forest characterization data for more than 90 plots on a transect spanning the boreal forest from northern Manitoba to southern Saskatchewan. Siltanen et al. (1997) provided a comprehensive database of soil carbon compiled from soil survey reports, inventories, and research projects from across Canada. The FECD is a compilation of comprehensive plot-level data for site, stand, and soil characteristics. It includes estimates of tree biomass carbon, soil carbon, and total ecosystem carbon for each plot. Collectively, the three projects provide a unique and valuable set of data for the forest research community.

INTRODUCTION

In 1995 the International Panel on Climate Change (IPCC) identified northern forested ecosystems as the most vulnerable to changing climate (1995 IPCC assessment; http://www.ipcc-wg2.org/index.html). Recent IPCC reports support that finding and have further noted that impacts from global change (climate change, land use, and pollution) are already discernible (2001 IPCC assessment; http://www.ipcc-wg2.org/index.html). Verifiable forest ecosytem models that can be applied across a wide range of spatial and temporal scales are essential to understanding and quantifying the vulnerability of Canada's forests. Most successful forest ecosytem models, regardless of their purpose or scale of application, require an explicit understanding of the relationships between stand productivity, and detrital and soil carbon dynamics.

National-scale carbon budget models are essential to the development of an effective policy for Canadian carbon stocks under a changing global climate (Kurz and Apps 1999). In 1999 the ENFOR (Energy From the Forest) priority setting and soil carbon workshops identified one of the major limitations of these models as the lack of data on detrital and soil carbon pools in major forest ecosystems and the lack of tools to project changes in these pools as a result of stand dynamics. Detrital pools from trees and understory vegetation include dead and downed wood, (often referred to as woody debris), foliar litter, and dead roots. The type, quantity, and timing of detrital inputs to the soil system are largely controlled by stand dynamics and disturbance patterns (Kurz and Apps 1999). Verifiable soil carbon pools are typically divided into an organic soil layer (i.e., the forest floor) and a mineral soil layer. Ideally, to support model verification and further development, a database is required where data for all these ecosystem components are collected simultaneously at the same location.

Although separate compilations already exist for carbon in soil profiles (Siltanen et al. 1997) and for tree biomass (Bonnor 1985) and volume (Lowe et al. 1991), a national database of plots in the forest regions of Canada where both types of data have been collected simultaneously has not previously existed. Canadian Forest Service (CFS) scientists understood that data on vegetation and soil collected for other purposes could be useful for model development and testing but were uncertain about the quantity and availability of such historical data. Consequently, the Forest Ecosystem Carbon Database (FECD) compilation project was undertaken with the primary objective of searching out and compiling existing plot-level data where sufficient primary data had been collected to estimate aboveground and belowground carbon pools.

This database, the FECD, provides support for the development and improvement of existing national-scale carbon budget models used for regional and national assessments. It provides the basis for validation (comparison) of simulation model results for the same stands and, in combination with other stand-level carbon budgets, for testable scaling of these results to the regional level. The data compiled will also contribute to research directed at enhancing the understanding of links between forest site characteristics, soil characteristics, and productivity.

The new National Forest Inventory initiative (Natural Resources Canada 1999), in which new plots are being established to meet multiple objectives, will contribute substantially to meeting data requirements, but it will take months to years before these data are available in a format that will be useful to large-scale modelers. The FECD can satisfy the immediate need of modelers for plot-level data and allows for meta-analysis of the relationships between stand-level estimates of tree biomass and soil carbon stocks.

PLOT SELECTION

Carbon stocks in forest ecosystems can be divided into the components of tree biomass carbon and carbon in the understory vegetation, detrital pools (such as coarse woody debris, and snags), the forest floor, and the mineral soil. The type of literature targeted by the FECD (historical inventories and research projects) did not typically report data for all these components at a single site. Historically, the most common type of data collected was tree mensuration (height, diameter at breast height), followed by soil profile descriptions, and then soil chemistry. Data for detrital pools and understory vegetation biomass were rarely collected. To meet the primary objective of the FECD, linking stand-level estimates for biomass carbon to soil carbon, the focus was on securing information for plots with the more commonly collected tree mensuration and soil profile data.

The following minimum requirements for accepting a plot into the database were established so that total forest ecosystem carbon for a plot (defined as the sum of tree biomass carbon, forest floor carbon, and mineral soil carbon) could be calculated. Latitude and longitude were required so that the plot-level data could be linked to other georeferenced data sets. Names of dominant tree species and soil classification were considered fundamental for describing the tree–soil system within the plot. In addition to meeting the criteria outlined below, the data had to be in the public domain or the contributor had to be willing to provide permission for the data to appear in the FECD, which is a public domain database.

Location:

- Latitude
- Longitude

Aboveground biomass:

- Plot-level estimate of live tree biomass, or volume, or diameter at breast height and (if available) height for individual trees; individual tree data could be used to estimate individual tree biomass and then plot-level biomass by using published equations
- Names of dominant tree species

Soil:

- Percent carbon or percent organic matter by horizon
- Horizon thickness
- Soil profile classification

After these criteria were established, provincial and federal government agencies, consultants, forest companies, and universities were contacted, and research publications were evaluated. Extensive data searches and evaluation of archival documents and tapes were performed. Once a plot was accepted for entry into the database, the data quality were checked, taxonomy was updated, and the data were put into the standard format of the FECD. Some plots were rejected because data did not meet the minimum criteria.

For plots that met the minimum requirements, available accessory plot-level information was recorded (site characteristics, vegetation types, and soil characteristics) on the assumption that it might aid in explaining trends or differences in carbon stocks between different types of ecosystems or ecosystem components.

As a result of these efforts the FECD holds data for 706 plots originating from eight sources (Table 1) and represents the largest, publicly available database of its type in Canada. The largest contributions came from Alberta Sustainable Resources Development, Resource Data Branch (Resource Data Branch 2002) and from CFS-led or CFS-partnered projects such as the Acid Rain Early Warning System (ARNEWS) (D'Eon et al. 1994), BOREAS (Halliwell and Apps 1997a, 1997b, 1997c) and a lodgepole pine and white spruce productivity study (La Roi and Pluth 1986).

The majority (494) of the plots were located in Alberta (Fig. 1, Table 2), with the rest relatively evenly distributed among the remaining provinces and territories, except for the Yukon Territory, Nunavut, and Newfoundland and Laborador, where there were no plots. The Boreal Shield and Boreal Plains ecozones are the ecozones best represented in the database, followed by the Taiga Plains and the Atlantic Maritime ecozones. The database represents an estimated 30–40% of the total amount of plot-level data in Canada that are known to the authors. The remaining 60–70% of the data resides in provincial government or private databases available only through data-sharing agreements, in unarchived storage, or in publications and unpublished research that could not be collated.

Table 1. Data sources for the Forest Ecosystem Carbon Database

Original source[a]	References	No. of plots
Halliwell and Apps 1997	Halliwell, D.H.; Apps, M.J. 1997a. BOReal Ecosystem–Atmosphere Study (BOREAS) biometry and auxiliary sites: locations and descriptions. Nat. Resour. Can., Can. For. Serv., North. For. Cent., Edmonton, AB. Halliwell, D.H.; Apps, M.J. 1997b. BOReal Ecosystem–Atmosphere Study (BOREAS) biometry and auxiliary sites: overstory and understory data. Nat. Resour. Can., Can. For. Serv., North. For. Cent., Edmonton, AB. Halliwell, D.H.; Apps, M.J. 1997c. BOReal Ecosystem–Atmosphere Study (BOREAS) biometry and auxiliary sites: soils and detritus data. Nat. Resour. Can., Can. For. Serv., North. For. Cent., Edmonton, AB.	90
Fyles 1986	Fyles, J.W. 1986. Interrelationships between vegetation, soil development and nitrogen and phosphorus cycling in upland coniferous forests near Hondo, Alberta. PhD thesis. Univ. Alberta. Edmonton, AB. Unpublished individual tree data, provided by D. MacIsaac from SEADYN (seasonal dynamics) boreal forest ecosystem study, G.H. La Roi, Dep. Biol., Univ. Alberta, Edmonton, AB.	4
Kingston et al. 1995	Kingston, D.G.O.; McMullin, C.; Webb, K.; Bauditz. C.; Mahendrappa, M.K. 1995. Lysimeter studies to evaluate the impacts of intensive harvesting and site preparation methods on site quality: an establishment report. Nat. Resour. Can., Can. For. Serv., Atl. For. Cent., Fredericton, NB. Inf. Rep. M-X-197E.	4
La Roi and Pluth 1986	La Roi, G.H.; Pluth, D.J. 1986. Lodgepole pine and white spruce site index curves and productivity–site relationships in western Alberta. Prepared for the Program of Research by Universities in Forestry, Can. For. Serv., North. For. Cent., Edmonton, AB. Individual tree data for plot names in Original_ Source_ID field beginning with "PSP" provided by D. Gilday from permanent sample plot data of Resource Analysis Section, Forest Management Branch, Alberta Sustainable Resource Development, Edmonton, AB.	115
Knapik et al. 1988	Knapik, L.J.; Russell, W.B.; Riddell, K.M.; Stevens, N. 1988. Forest ecosystem classification and land system mapping pilot project. Duck Mountain, Manitoba. Prepared for Canadian Forest Service and Manitoba Forestry Branch by PEDOCAN Land Evaluation Ltd., Edmonton, AB.	15
Knapik et al. 1989	Knapik, L.J.; Ellis, R.A.; Phillips, B. 1989. Forest ecosystem classification and land system mapping pilot project. Sandilakes, Manitoba. Prepared for Canadian Forest Service and Manitoba Forestry Branch by PEDOCAN Land Evaluation Ltd., Edmonton, AB.	11
ESIS[b]	Resource Data Branch. 2002. Alberta ecological site data and ecological site description manual. Alberta Sustainable Resource Development, Edmonton, AB.	374
ARNEWS[c]	D'Eon, S.P.; Magasi, L.P.; Lachance, D.; DesRochers, P. 1994. ARNEWS. Canada's national forest health monitoring plot network. Manual on plot establishment and monitoring (revised). Nat. Resour. Can., Can. For. Serv., Petawawa Natl. For. Inst., Chalk River, ON. Inf. Rep. PI-X-117. Data from National Forest Health and Biodiversity Database provided by S. Martin, Nat. Resour. Can., Can. For. Serv., Atl. For. Cent., Fredericton, NB.	93
Total		706

[a] Original source is the name of the field used in the database.

[b] ESIS = Alberta Ecological Site Data.

[c] ARNEWS = Acid Rain Early Warning System.

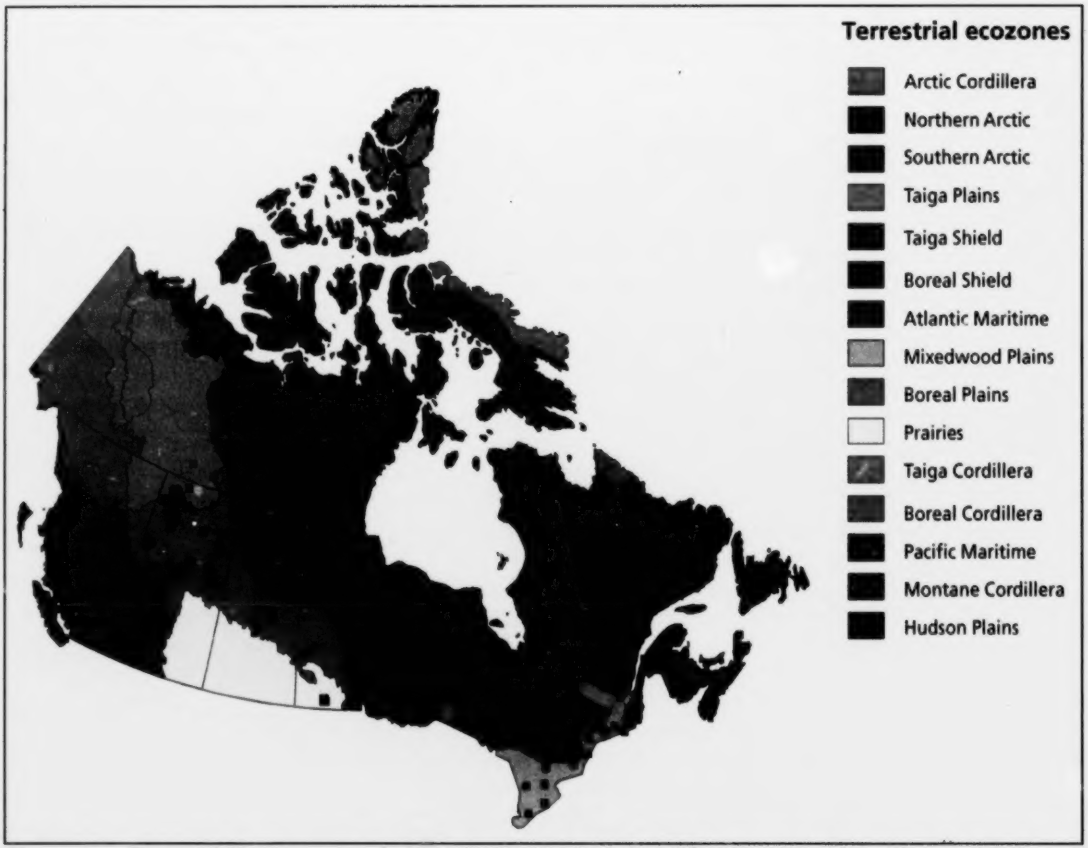

Terrestrial ecozones
Arctic Cordillera
Northern Arctic
Southern Arctic
Taiga Plains
Taiga Shield
Boreal Shield
Atlantic Maritime
Mixedwood Plains
Boreal Plains
Prairies
Taiga Cordillera
Boreal Cordillera
Pacific Maritime
Montane Cordillera
Hudson Plains

Figure 1. Terrestrial ecozones of Canada (Ecological Stratification Working Group 1996) and distribution of 706 plots in the Forest Ecosystem Carbon Database.

Table 2. Number of plots in the Forest Ecosystem Carbon Database, grouped by jurisdiction and terrestrial ecozone

Province or territory	No. of plots	Terrestrial ecozone[a]	No. of plots
Alberta	494	Taiga Plains	36
British Columbia	13	Western Taiga Shield	7
Manitoba	64	Eastern Taiga Shield	0
New Brunswick	6	Boreal Shield	102
Newfoundland and Labrador	0	Atlantic Maritime	30
Northwest Territories	2	Mixedwood Plains	10
Nova Scotia	14	Boreal Plains	494
Nunavut	0	Prairies	0
Ontario	37	Taiga Cordillera	0
Prince Edward Island	1	Boreal Cordillera	0
Québec	21	Pacific Maritime	9
Saskatchewan	54	Montane Cordillera	16
Yukon Territory	0	Hudson Plains	2
Total	706	Total	706

[a] Ecological Stratification Working Group (1996).

Note: Table 2 includes ecozones with forested land. The ecozones present in Figure 1 and not included in Table 2 are not forested.

ORGANIZATION OF THE DATA

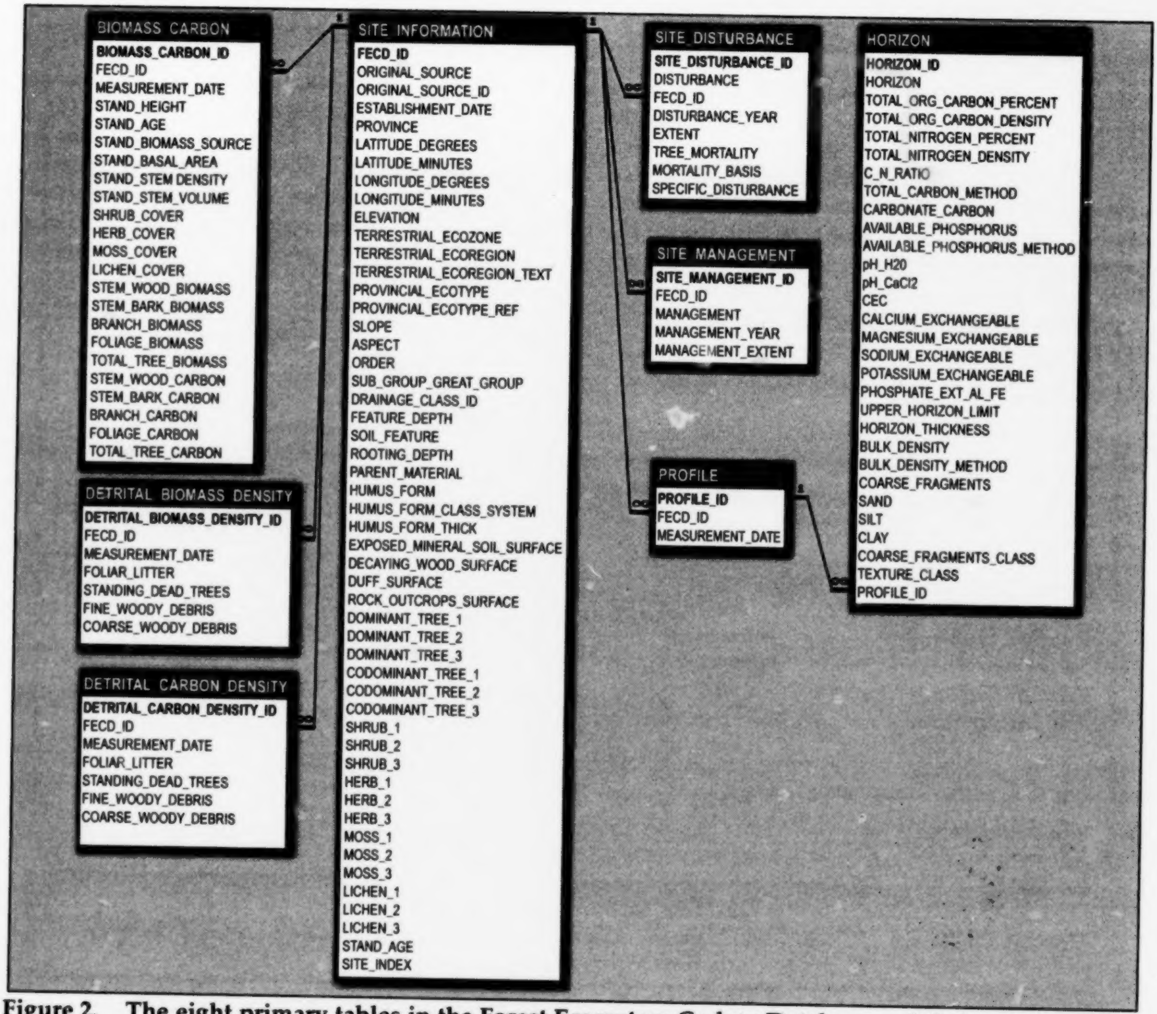
The database was developed in Microsoft Access (Microsoft 2000a) and comprises eight primary tables (Table 3) containing the plot data and 10 accessory tables (Table 4) that hold taxonomic or categorical data used in drop-down boxes during data entry and retrieval. All of the tables are linked through the common FECD_ID field, with the exception of the HORIZON table. The HORIZON table is linked to the other tables by the PROFILE table, which contains the PROFILE_ID field (common to the HORIZON table) and the FECD_ID field (common to the other tables) (Fig. 2). Instructions for installation of the FECD onto the user's hard drive are provided in the READ-ME-FIRST document on the accompanying disk (see inside back cover). Copies of all the Access tables were saved onto the accompanying disk as Microsoft Excel files (Microsoft 2000b) for users who do not have Microsoft Access available to them. See the READ-ME-FIRST document for instructions on how to use the Excel files.

Table 3. Primary tables in the Forest Ecosystem Carbon Database

Table name	Description
Biomass_Carbon	Stand-level estimates for trees and other vegetation, including tree basal area, stems, density, volume, biomass, carbon
Detrital_Biomass	Information on biomass of measured detrital pools such as litter and woody debris
Detrital_Carbon_ Content	Estimates of carbon from the Detrital_Biomass table
Site_Information	Site description information such as plot source, identification, slope, aspect, species of vegetation
Site_Disturbance	Information about natural disturbance history such as fires and insect damage
Site_Management	Information about site management history such as date and type of harvesting or silvicultural practice
Profile	Date for soil profile description; acts as a link between the Horizon and Site_Information tables
Horizon	Soil horizon information such as horizon name and soil chemical and physical data

Table 4. Accessory tables in the Forest Ecosystem Carbon Database

Table name	Description
Tree_Species_Codes	List of tree species codes and corresponding names (Appendix 1)
Shrub_Species_Codes	List of shrub species codes and corresponding names (Appendix 1)
Herb_Species_Codes	List of herb species codes and corresponding names (Appendix 1)
Moss_Species_Codes	List of moss species codes and corresponding names (Appendix 1)
Lichen_Species_Codes	List of lichen species codes and corresponding names (Appendix 1)
Soil_Taxonomy	List of soil orders and soil great groups and sub groups (Soil Classification Working Group 1998)
Terrestrial_Ecozone	List of terrestrial ecozones (by name) (Ecological Stratification Working Group 1996)
Terrestrial_Ecoregion	List of terrestrial ecoregions (by name) within ecozones (Ecological Stratification Working Group 1996)
Terrestrial_Ecodistricts	List of terrestrial ecodistricts (by number) within ecoregions (Ecological Stratification Working Group 1996)
Coarse_Fragments	List of coarse fragment classes (Shields et al. 1991)


BIOMASS CARBON
BIOMASS_CARBON_ID
FECD_ID
MEASUREMENT_DATE
STAND_HEIGHT
STAND_AGE
STAND_BIOMASS_SOURCE
STAND_BASAL_AREA
STAND_STEM DENSITY
STAND_STEM_VOLUME
SHRUB_COVER
HERB_COVER
MOSS_COVER
LICHEN_COVER
STEM_WOOD_BIOMASS
STEM_BARK_BIOMASS
BRANCH_BIOMASS
FOLIAGE_BIOMASS
TOTAL_TREE_BIOMASS
STEM_WOOD_CARBON
STEM_BARK_CARBON
BRANCH_CARBON
FOLIAGE_CARBON
TOTAL_TREE_CARBON
DETRITAL BIOMASS DENSITY
DETRITAL_BIOMASS_DENSITY_ID
FECD_ID
MEASUREMENT_DATE
FOLIAR_LITTER
STANDING_DEAD_TREES
FINE_WOODY_DEBRIS
COARSE_WOODY_DEBRIS
DETRITAL CARBON DENSITY
DETRITAL_CARBON_DENSITY_ID
FECD_ID
MEASUREMENT_DATE
FOLIAR_LITTER
STANDING_DEAD_TREES
FINE_WOODY_DEBRIS
COARSE_WOODY_DEBRIS
SITE INFORMATION
FECD_ID
ORIGINAL_SOURCE
ORIGINAL_SOURCE_ID
ESTABLISHMENT_DATE
PROVINCE
LATITUDE_DEGREES
LATITUDE_MINUTES
LONGITUDE_DEGREES
LONGITUDE_MINUTES
ELEVATION
TERRESTRIAL_ECOZONE
TERRESTRIAL_ECOREGION
TERRESTRIAL_ECOREGION_TEXT
PROVINCIAL_ECOTYPE
PROVINCIAL_ECOTYPE_REF
SLOPE
ASPECT
ORDER
SUB_GROUP_GREAT_GROUP
DRAINAGE_CLASS_ID
FEATURE_DEPTH
SOIL_FEATURE
ROOTING_DEPTH
PARENT_MATERIAL
HUMUS_FORM
HUMUS_FORM_CLASS_SYSTEM
HUMUS_FORM_THICK
EXPOSED_MINERAL_SOIL_SURFACE
DECAYING_WOOD_SURFACE
DUFF_SURFACE
ROCK_OUTCROPS_SURFACE
DOMINANT_TREE_1
DOMINANT_TREE_2
DOMINANT_TREE_3
CODOMINANT_TREE_1
CODOMINANT_TREE_2
CODOMINANT_TREE_3
SHRUB_1
SHRUB_2
SHRUB_3
HERB_1
HERB_2
HERB_3
MOSS_1
MOSS_2
MOSS_3
LICHEN_1
LICHEN_2
LICHEN_3
STAND_AGE
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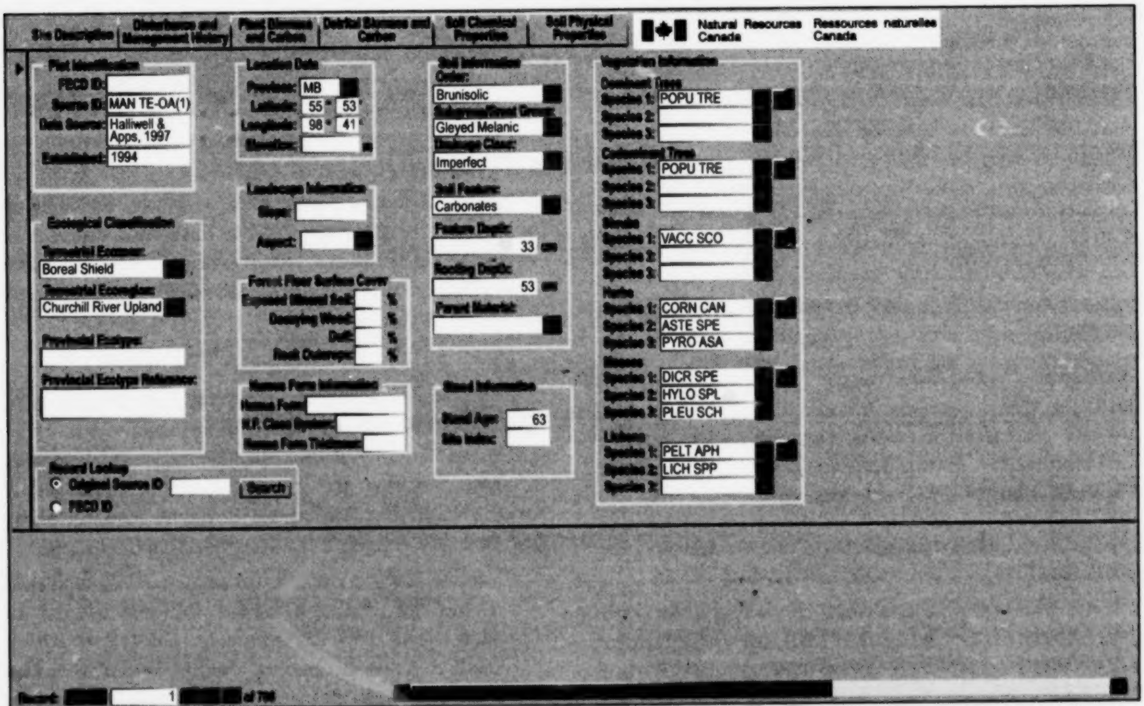
SITE DISTURBANCE
SITE_DISTURBANCE_ID
DISTURBANCE
FECD_ID
DISTURBANCE_YEAR
EXTENT
TREE_MORTALITY
MORTALITY_BASIS
SPECIFIC_DISTURBANCE
SITE MANAGEMENT
SITE_MANAGEMENT_ID
FECD_ID
MANAGEMENT
MANAGEMENT_YEAR
MANAGEMENT_EXTENT
PROFILE
PROFILE_ID
FECD_ID
MEASUREMENT_DATE
HORIZON
HORIZON_ID
HORIZON
TOTAL_ORG_CARBON_PERCENT
TOTAL_ORG_CARBON_DENSITY
TOTAL_NITROGEN_PERCENT
TOTAL_NITROGEN_DENSITY
C_N_RATIO
TOTAL_CARBON_METHOD
CARBONATE_CARBON
AVAILABLE_PHOSPHORUS
AVAILABLE_PHOSPHORUS_METHOD
pH_H20
pH_CaCl2
CEC
CALCIUM_EXCHANGEABLE
MAGNESIUM_EXCHANGEABLE
SODIUM_EXCHANGEABLE
POTASSIUM_EXCHANGEABLE
PHOSPHATE_EXT_AL_FE
UPPER_HORIZON_LIMIT
HORIZON_THICKNESS
BULK_DENSITY
BULK_DENSITY_METHOD
COARSE_FRAGMENTS
SAND
SILT
CLAY
COARSE_FRAGMENTS_CLASS
TEXTURE_CLASS
PROFILE_ID

Figure 2. **The eight primary tables in the Forest Ecosystem Carbon Database and their relationships.** Note: The number one and ∞ symbol outside framed boxes of text signify the relationships between fields (i.e., many fields to one field, one field to one field, and many fields to many fields).

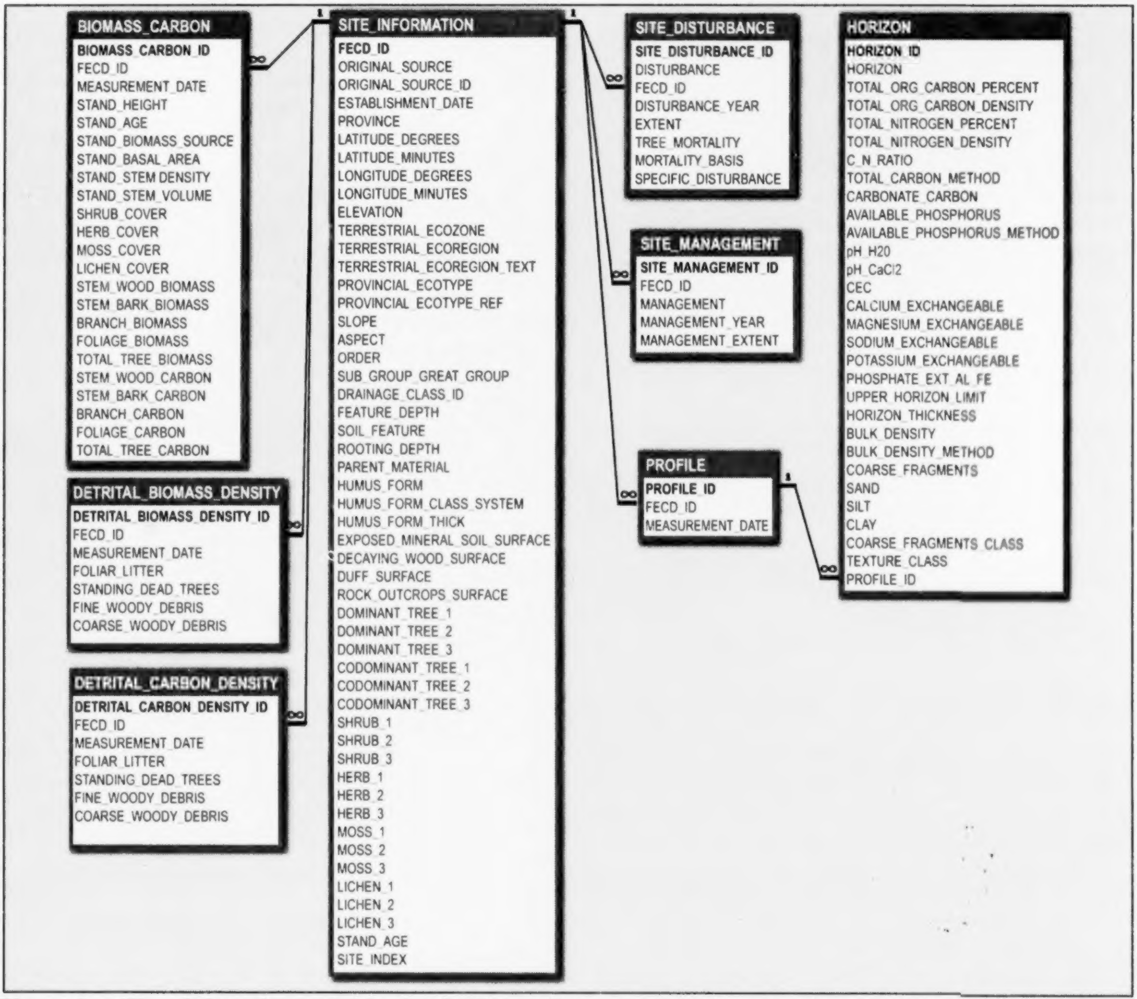
In addition to the data tables, the FECD contains a user-friendly interface in Access that facilitated data entry and allows for searching and browsing through the database on a plot-by-plot basis (Fig. 3). Tabs running across the top of the interface roughly correspond to the tables. Buttons in the lower left-hand corner allow for rapid access to plots identified by FECD number or the original plot name. Once a plot is located on the "Site Description" tab, the correct data for that plot automatically appear in the form associated with each of the other tabs. The FECD database is not editable, to ensure that the data remain unaltered from their original state. However, a template of the database and the user-friendly interface are provided for those who wish to use the database structure for their own data collection or compilation purposes. Details on how to use the interface are found in the section entitled "The FECD Template."

Range-checking, data re-entry, and extensive spot-checking against the original data were used to reduce transcription and calculation errors. Range-checking of derived values was used to check the original data. For example, unusual values for the carbon–nitrogen ratio could be used to identify a potential error in the Total_Carbon_Percent or Total_Nitrogen_Percent data. Additional features were built into the database to help avoid data entry problems. For example, the sum of the percent sand, silt, and clay had to equal 100 before the soil texture class could be determined. Most of the data entry for descriptive information used drop-down boxes, restricting the choices for that field and avoiding typographic entry errors. For example, once the Terrestrial_Ecozone was selected, the choices for Terrestrial_Ecoregion were restricted to those within the chosen ecozone. A similar approach was taken with the Order and Sub_Group_Great_Group fields for soil classification. Within vegetation types, species names could be selected only once from the list provided, to avoid repeat entry errors. As with most large and complex databases some errors are expected to remain undetected. If a user detects or suspects that an error exists in the data, he or she should refer back to the original source.



Source ID: MAN TE-OA(1)
Data Source: Halliwell & Apps, 1997
Established: 1994
Province: MB
Latitude: 55° 53'
Longitude: 98° 41'
Terrestrial Ecozone: Boreal Shield
Terrestrial Ecoregion: Churchill River Upland
Order: Brunisolic
Subgroup/Great Group: Gleyed Melanic
Drainage Class: Imperfect
Soil Feature: Carbonates
Feature Depth: 33 cm
Rooting Depth: 53 cm
Stand Age: 63
Dominant Trees Species 1: POPU TRE
Codominant Trees Species 1: POPU TRE
Shrubs Species 1: VACC SCO
Herbs Species 1: CORN CAN
Herbs Species 2: ASTE SPE
Herbs Species 3: PYRO ASA
Mosses Species 1: DICR SPE
Mosses Species 2: HYLO SPL
Mosses Species 3: PLEU SCH
Lichens Species 1: PELT APH
Lichens Species 2: LICH SPP
Record: 1

Figure 3. User-friendly interface with convenient tabs across the top for various data entry forms, drop-down boxes for entry of vegetation, soil and ecological classification information and search and browse buttons to manoeuvre between records.


BIOMASS_CARBON
BIOMASS_CARBON_ID
FECD_ID
MEASUREMENT_DATE
STAND_HEIGHT
STAND_AGE
STAND_BIOMASS_SOURCE
STAND_BASAL_AREA
STAND_STEM_DENSITY
STAND_STEM_VOLUME
SHRUB_COVER
HERB_COVER
MOSS_COVER
LICHEN_COVER
STEM_WOOD_BIOMASS
STEM_BARK_BIOMASS
BRANCH_BIOMASS
FOLIAGE_BIOMASS
TOTAL_TREE_BIOMASS
STEM_WOOD_CARBON
STEM_BARK_CARBON
BRANCH_CARBON
FOLIAGE_CARBON
TOTAL_TREE_CARBON
DETRITAL_BIOMASS_DENSITY
DETRITAL_BIOMASS_DENSITY_ID
FECD_ID
MEASUREMENT_DATE
FOLIAR_LITTER
STANDING_DEAD_TREES
FINE_WOODY_DEBRIS
COARSE_WOODY_DEBRIS
DETRITAL_CARBON_DENSITY
DETRITAL_CARBON_DENSITY_ID
FECD_ID
MEASUREMENT_DATE
FOLIAR_LITTER
STANDING_DEAD_TREES
FINE_WOODY_DEBRIS
COARSE_WOODY_DEBRIS
SITE_INFORMATION
FECD_ID
ORIGINAL_SOURCE
ORIGINAL_SOURCE_ID
ESTABLISHMENT_DATE
PROVINCE
LATITUDE_DEGREES
LATITUDE_MINUTES
LONGITUDE_DEGREES
LONGITUDE_MINUTES
ELEVATION
TERRESTRIAL_ECOZONE
TERRESTRIAL_ECOREGION
TERRESTRIAL_ECOREGION_TEXT
PROVINCIAL_ECOTYPE
PROVINCIAL_ECOTYPE_REF
SLOPE
ASPECT
ORDER
SUB_GROUP_GREAT_GROUP
DRAINAGE_CLASS_ID
FEATURE_DEPTH
SOIL_FEATURE
ROOTING_DEPTH
PARENT_MATERIAL
HUMUS_FORM
HUMUS_FORM_CLASS_SYSTEM
HUMUS_FORM_THICK
EXPOSED_MINERAL_SOIL_SURFACE
DECAYING_WOOD_SURFACE
DUFF_SURFACE
ROCK_OUTCROPS_SURFACE
DOMINANT_TREE_1
DOMINANT_TREE_2
DOMINANT_TREE_3
CODOMINANT_TREE_1
CODOMINANT_TREE_2
CODOMINANT_TREE_3
SHRUB_1
SHRUB_2
SHRUB_3
HERB_1
HERB_2
HERB_3
MOSS_1
MOSS_2
MOSS_3
LICHEN_1
LICHEN_2
LICHEN_3
STAND_AGE
SITE_INDEX
SITE_DISTURBANCE
SITE_DISTURBANCE_ID
DISTURBANCE
FECD_ID
DISTURBANCE_YEAR
EXTENT
TREE_MORTALITY
MORTALITY_BASIS
SPECIFIC_DISTURBANCE
SITE_MANAGEMENT
SITE_MANAGEMENT_ID
FECD_ID
MANAGEMENT
MANAGEMENT_YEAR
MANAGEMENT_EXTENT
PROFILE
PROFILE_ID
FECD_ID
MEASUREMENT_DATE
HORIZON
HORIZON_ID
HORIZON
TOTAL_ORG_CARBON_PERCENT
TOTAL_ORG_CARBON_DENSITY
TOTAL_NITROGEN_PERCENT
TOTAL_NITROGEN_DENSITY
C_N_RATIO
TOTAL_CARBON_METHOD
CARBONATE_CARBON
AVAILABLE_PHOSPHORUS
AVAILABLE_PHOSPHORUS_METHOD
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POTASSIUM_EXCHANGEABLE
PHOSPHATE_EXT_AL_FE
UPPER_HORIZON_LIMIT
HORIZON_THICKNESS
BULK_DENSITY
BULK_DENSITY_METHOD
COARSE_FRAGMENTS
SAND
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CLAY
COARSE_FRAGMENTS_CLASS
TEXTURE_CLASS
PROFILE_ID
1
∞

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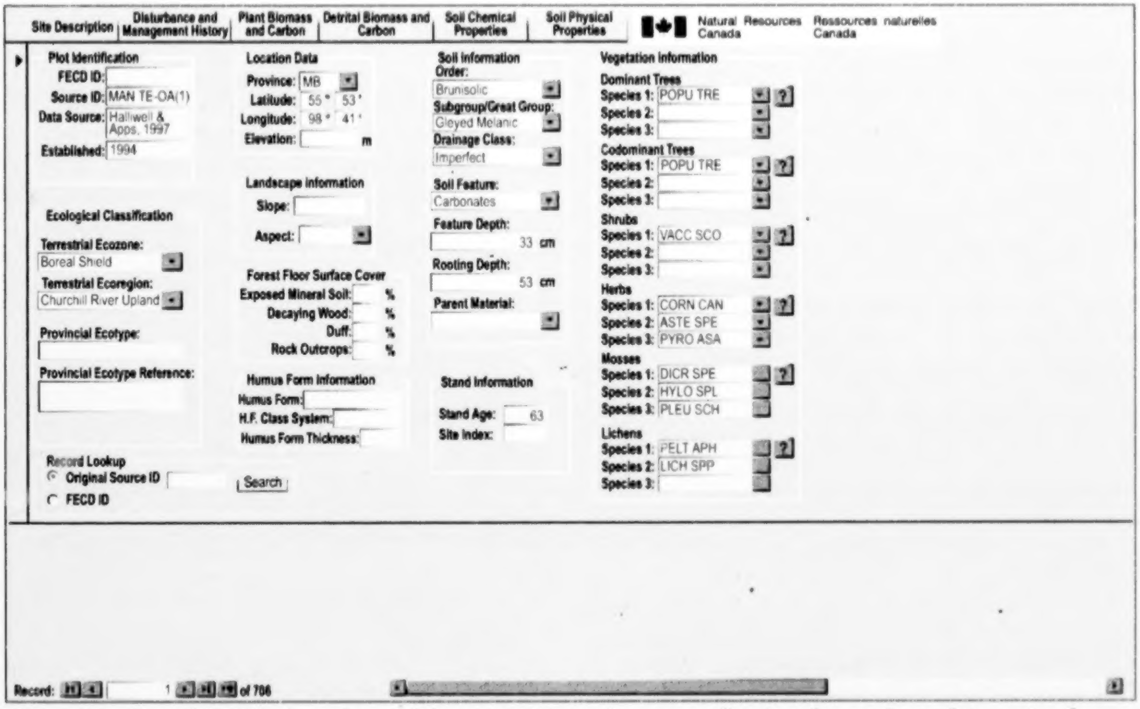

Plot Identification
FECD ID:
Source ID: MAN TE-OA(1)
Data Source: Halliwell & Apps, 1997
Established: 1994

Ecological Classification
Terrestrial Ecozone: Boreal Shield
Terrestrial Ecoregion: Churchill River Upland
Provincial Ecotype:
Provincial Ecotype Reference:

Record Lookup
● Original Source ID
○ FECD ID

Location Data
Province: MB
Latitude: 55 ° 53 '
Longitude: 98 ° 41 '
Elevation: m

Landscape Information
Slope:
Aspect:

Forest Floor Surface Cover
Exposed Mineral Soil: %
Decaying Wood: %
Duff: %
Rock Outcrops: %

Humus Form Information
Humus Form:
H.F. Class System:
Humus Form Thickness:

Soil Information
Order: Brunisolic
Subgroup/Great Group: Gleyed Melanic
Drainage Class: Imperfect
Soil Feature: Carbonates
Feature Depth: 33 cm
Rooting Depth: 53 cm
Parent Material:

Stand Information
Stand Age: 63
Site Index:

Vegetation Information
Dominant Trees
Species 1: POPU TRE
Species 2:
Species 3:
Codominant Trees
Species 1: POPU TRE
Species 2:
Species 3:
Shrubs
Species 1: VACC SCO
Species 2:
Species 3:
Herbs
Species 1: CORN CAN
Species 2: ASTE SPE
Species 3: PYRO ASA
Mosses
Species 1: DICR SPE
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Species 3: PLEU SCH
Lichens
Species 1: PELT APH
Species 2: LICH SPP
Species 3:

Record: 1 of 706

Figure 3. **User-friendly interface with convenient tabs across the top for various data entry forms, drop-down boxes for entry of vegetation, soil and ecological classification information and search and browse buttons to manoeuvre between records.**

The FECD is a user-friendly product that does not use numeric coding for field attributes. In most cases, the field attribute is fully displayed in words. For example, the terrestrial ecosystem name and soil taxonomic classes are fully displayed in words rather than being identified by codes that might be difficult to decipher. The only abbreviations used are those that are easy to understand, such as the familiar two-letter codes for the provinces and territories (e.g., AB for Alberta) and site aspects (e.g., NW for northwest). Codes were also used for scientific names of vegetation (4 letters for genus name and 3 letters for species epithet), but the interface provides a query button (?) that rapidly allows the user to associate the genus and species abbreviation with the appropriate full text. Appendix 1 lists the plant genus and species codes and corresponding full names.

The following text describes all of the fields and their attributes for the eight primary tables holding plot-level data.

Site_Information Table

The Site_Information table contains data for ecosystem characteristics. Table 5 summarizes the fields in the Site_Information table. References are provided for original definitions of the attributes where required (Table 5).

All data in the Site_Information table appear as provided by the contributor, with the following exceptions.

Terrestrial_Ecozone and Terrestrial_Ecoregion

Names of terrestrial ecozones and ecoregions were determined by overlaying the latitude and longitude coordinates for each plot on the terrestrial ecozone map provided on the Environment Canada terrestrial ecozone website (www.ccea.org/ecozones/terr.html).

Order and Sub_Group_Great_Group (soil classification)

All soil profile descriptions and taxonomy were checked to ensure that horizon designations and classifications were consistent with the current Canadian System of Soil Classification (Soil Classification Working Group 1998); this resulted in a few minor changes. The appropriate taxonomy was determined for soil profiles that had not been classified by the original contributor.

Stand_Age

For the majority of plots (La Roi and Pluth 1986; Halliwell and Apps 1997b; Resource Data Branch 2000), stand age was calculated as the mean value of breast height age for the dominant and codominant trees for which breast height age was measured. In most cases this represented a small subset of trees on the plot. No data on breast height age were collected for the ARNEWS plots, but incremental growth ring data were provided for some of the plots (D'Eon et al. 1994). The total number of rings for individual trees was used to estimate the age of individual dominant and codominant trees, and the mean of the available ages was used to estimate stand age for these plots. Data on age class structure were available for the Fyles (1986) plots. In this case, stand age was estimated as the age class holding the largest number of dominant and codominant trees. The estimates for stand age provided by Knapik et al. (1988, 1989) were entered directly into the FECD. Insufficient data were available to estimate age for the four Kingston et al. (1995) plots, one Halliwell and Apps (1997b) plot, three ESIS plots (Resource Data Branch 2000), and 11 ARNEWS plots (D'Eon et al. 1994).

Biomass_Carbon Table

The Biomass_Carbon table contains stand-level estimates (for live trees only) of height, basal area, and stem density, as well as stand-level estimates for biomass and carbon in live tree components (stem wood, branches, stem bark, foliage) and their totals (Table 6). Estimates of percent cover for shrubs, herbs, mosses, and lichens are also provided (Table 6).

For most of the plots, values for fields in this table were calculated from individual tree data and percent cover data for individual species of shrubs, herbs, mosses, and lichens, as provided by the contributor. The approaches to estimating the values for each field are described below.

- Stand_Height (m): Stand height was estimated using the median value for the height of dominant and codominant trees for which height measurements were available. The median was chosen rather than the mean because it is less sensitive to influence from extreme outliers (Sokal and Rolf 1997).
- Stand_Age (years): As previously described for the Site_Information table.

- Stand_Basal_Area ($m^2\ ha^{-1}$): Estimates of live stand basal area were provided by Halliwell and Apps (1997b) and Kingston et al. (1995). These values were entered directly into the FECD. For the remaining plots for which individual tree data were provided (Fyles 1986; La Roi and Pluth 1986; D'Eon et al. 1994; Resource Data Branch 2000) Stand_Basal_Area was calculated using equation 1:

$$BA = \frac{\sum_{i=1}^{n} \pi \left(\frac{DBH_i}{2} \right)^2}{A} \qquad [1]$$

  where BA is the stand basal area, DBH_i is the diameter at breast height of an individual tree, n is the total number of trees in the plot, and A is the area of the sample plot. When DBH is in centimeters and plot area is in square meters, the unit for basal area is centimeters per square meter, which is equivalent to square meters per hectare. There are no estimates for basal area for the Knapik et al. (1988, 1989) plots, since data for this variable were not provided in the report, and the individual tree data required for the calculation were not available.

- Stand_Stem_Density (number ha^{-1}): Estimates of live stem density provided by Halliwell and Apps (1997b) were entered directly into the FECD. For the remaining plots for which individual tree data were provided (La Roi and Pluth 1986; Fyles 1986; D'Eon et al. 1994; Resource Data Branch 2000), Stand_Stem_Density was calculated using equation 2:

$$\text{Stem density} = \frac{n}{A} \qquad [2]$$

  where n is the number of individual trees in the plot area (A).

- Stand_Stem_Volume ($m^3\ ha^{-1}$): Stand stem volume was entered into the FECD only if it was provided by the contributor. Data were available for plots described by Halliwell and Apps (1997b), Kingston et al. (1995), Knapik et al. (1988, 1989), and La Roi and Pluth (1986). The approach to estimating volume can vary significantly between sources and may not be directly comparable, as outlined below.

  Halliwell and Apps (1997b) estimated the volume of wood in the tree stems in terms of inside bark values. The estimate excluded branches and foliage but included the entire stem. It was expected that this volume would be high compared with merchantable volume, which is commonly used in commercial surveys.

  Kingston et al. (1995) estimated both total and merchantable volume using the tables published by Honer et al. (1983). The volume estimates that appear in the FECD represent total volume, and they are slightly higher than the reported estimates for merchantable volume. Merchantable volumes reported by Kingston et al. (1995) for the West Brook Road, Dickey Lake Road, West River Station, and McIntryes Mountain sites were 356, 158, 174, and 202 $m^3\ ha^{-1}$, respectively.

  Knapik et al. (1988, 1989) did not provide details or a reference for the volume calculations, except to say that the values reported represented "gross merchantable volume" using a "Manitoba volume equation."

  La Roi and Pluth (1986) reported volume calculated using a FORTRAN program developed by Pluth and Cameron (1971), but the equations used in the calculations were not specified.

- Shrub, Herb, Moss, and Lichen_Cover: Data from ocular estimates of percent cover by species for the shrub, herb, moss, and lichen vegetation layers were provided by Resource Data Branch (2000), D'Eon et al. 1994; Halliwell and Apps (1997b), and La Roi and Pluth (1986). For the FECD a total percent cover for each vegetation layer was estimated by summing the percent cover for individual species within a layer to a maximum of 100%. These estimates were completed for plots from La Roi and Pluth (1986), Halliwell and Apps (1997b) and ESIS (Resource Data Branch 2000), but because of time constraints the data from ARNEWS (D'Eon et al. 1994) were not summarized or entered into the FECD.

- Stem_Wood, Stem_Bark, Branch, and Foliage_Biomass ($t\ ha^{-1}$): Individual tree data were provided for most of the plots (Fyles 1986; La Roi and Pluth 1986; D'Eon et al. 1994; Halliwell and Apps 1997b; Resource Data Branch 2000), and estimates of live tree biomass by component (stem wood, stem bark, branches, and foliage) for each tree in the plot were calculated. These values were summed over all trees in the plot to yield stand-level estimates for each component and then summed over the components to provide an estimate of total live tree biomass.

Table 5. Summary of fields in the Site_Information table (maximum of 706 records [plots])

Field name	Description	Reference	No. (and %) of records
FECD_ID	Unique identifier, automatically assigned by database	NA[a]	706 (100)
Original_Source	Name of contributor (data source)	Table 1	706 (100)
Original_Source_ID	Original plot name given by contributor	NA	706 (100)
Establishment_Date	Year the plot was established in the field	NA	706 (100)
Province	Abbreviation for province or territory	NA	706 (100)
Latitude_degrees	Latitude degrees	NA	706 (100)
Latitude_minutes	Latitude minutes	NA	702 (99)
Longitude_degrees	Longitude degrees	NA	706 (100)
Longitude_minutes	Longitude minutes	NA	702 (99)
Elevation	Elevation above sea level (m)	NA	583 (83)
Terrestrial_Ecozone	Terrestrial ecozone name	Ecological Stratification Working Group (1996)	706 (100)
Terrestrial_Ecoregion	Terrestrial ecoregion name	Ecological Stratification Working Group (1996)	706 (100)
Provincial_Ecotype	Provincial ecotype name, provided by contributor	NA	128 (18)
Provincial_Ecotype_Ref	Reference for provincial ecotype classification	NA	128 (18)
Slope	Percent slope	NA	475 (67)
Aspect	Aspect (N, NW, W, etc.)	NA	492 (70)
Order	Soil order name	Soil Classification Working Group (1998)	706 (100)
Sub_Group_Great_Group	Combined soil subgroup/great group name	Soil Classification Working Group (1998)	706 (100)
Drainage_Class_ID	Drainage class name	Soil Classification Working Group (1998)	615 (87)
Feature_Depth	Depth (cm) to soil feature	NA	125 (18)
Soil_Feature	Soil feature name (e.g., carbonates)	Soil Classification Working Group (1998)	127 (18)
Rooting_Depth	Depth (cm) at which rooting abundance drops to few	Luttmerding et al. 1990	420 (59)
Parent_Material	Mode of deposition of soil parent material	Soil Classification Working Group (1998)	588 (83)
Humus_Form	Name of humus form classification	NA	92 (13)
Humus_Form_Class_System	Reference for humus form classification	NA	92 (13)
Humus_Form_Thick	Thickness (cm) of humus form	NA	26 (4)
Exposed_Mineral_Soil_ Surface	Percent of ground surface area that is exposed mineral soil	Luttmerding et al. 1990	233 (33)
Decaying_Wood_Surface	Percent of ground surface area that is decaying wood	Luttmerding et al. 1990	370 (52)
Duff_Surface	Percent of ground surface area that is decomposing organic matter other than wood	Luttmerding et al. 1990	372 (53)
Rock_Outcrops_Surface	Percent of ground surface area that is rock	Luttmerding et al. 1990	232 (33)
Dominant_Tree_1 (2) (3)	Names of first, second, and third most dominant tree species	Appendix 1	678 (96) 385 (54), 164 (23)
Codominant_Tree_1 (2) (3)	Names of first, second, and third most dominant among codominant tree species	Appendix 1	563 (80), 358 (51), 163 (23)
Shrub_1 (2) (3)	Names of first, second, and third most abundant shrub species	Appendix 1	603 (85), 601 (85), 590 (84)
Herb_1 (2) (3)	Names of first, second, and third most abundant herb species	Appendix 1	597 (85), 590 (84), 580 (82)
Moss_1 (2) (3)	Names of first, second, and third most abundant moss species	Appendix 1	587 (83), 561 (79), 525 (74)
Lichen_1 (2) (3)	Names of first, second, and third most abundant lichen species	Appendix 1	465 (66), 366 (52), 279 (40)
Stand_Age	Average stand age (years)	NA	687 (97)
Site_Index	Height (m) at 50 years of age	NA	132 (19)

[a] NA = not applicable.

Table 6. Summary of fields in the Biomass_Carbon table (maximum of 706 records [plots])

Field name	Description	No. (and %) of records
Biomass_Carbon_ID	Unique identifier, automatically assigned by database	706 (100)
FECD_ID	Same as in Site_Information table (see Table 5)	706 (100)
Measurement_Date	Year when trees were measured	706 (100)
Stand_Height	Median stand height (m)	702 (99)
Stand_Age	Average stand age (years) (same as in Table 5)	687 (97)
Stand_Biomass_Source	Provides reference for biomass equations used in data source	4 (.01)
Stand_Basal_Area	Basal area (m^2 ha^{-1})	680 (96)
Stand_Stem_Density	Number of live tree stems per hectare	676 (96)
Stand_Stem_Volume	Stand stem volume, as provided by contributor (m^3 ha^{-1})	196 (28)
Shrub_Cover	Percent ground area covered by shrubs	602 (85)
Herb_Cover	Percent ground area covered by herbs	602 (85)
Moss_Cover	Percent ground area covered by moss	601 (85)
Lichen_Cover	Percent ground area covered by lichens	586 (83)
Stem_Wood_Biomass	Biomass of live tree stems (t ha^{-1})	706 (100)
Stem_Bark_Biomass	Biomass of live tree bark (t ha^{-1})	706 (100)
Branch_Biomass	Biomass of live tree branches (t ha^{-1})	706 (100)
Foliage_Biomass	Biomass of live tree foliage (t ha^{-1})	706 (100)
Total_Tree_Biomass	Sum of Stem_Wood_Biomass, Stem_Bark_Biomass, Branch_Biomass, and Foliage_Biomass (t ha^{-1})	706 (100)
Stem_Wood_Carbon	Carbon in live tree stem wood (t ha^{-1})	706 (100)
Stem_Bark_Carbon	Carbon in live tree stem bark (t ha^{-1})	706 (100)
Branch_Carbon	Carbon in live tree branches (t ha^{-1})	706 (100)
Foliage_Carbon	Carbon in live tree foliage (t ha^{-1})	706 (100)
Total_Tree_Carbon	Sum of Stem_Wood_Carbon, Stem_Bark_Carbon, Branch_Carbon, and Foliage_Carbon (t ha^{-1})	706 (100)

Biomass of the components was calculated using published allometric equations (referenced in Appendix 2), which require species, diameter at breast height, and height data for each tree in the plot. Selection of the appropriate equation was based on the tree's species and plot location (combination of province or territory and terrestrial ecozone).

Height was not always measured for all the trees in the plots. Where required, tree height was estimated from the equations of Halliwell and Apps (1997b) before biomass was estimated.

For a small percentage of the plots (Knapik et al. 1988, 1989; Kingston et al. 1995) individual tree data were not published, but stand-level estimates for volume or biomass were available. CFS scientists are developing equations to predict stand-level biomass for components (and totals) based on merchantable stand volume for each province or territory and ecozone, using different combinations of dominant tree species or stand types defined by the proportion of coniferous trees present in the stands. These preliminary equations were used to estimate the biomass of tree components and their total for the Knapik et al. (1988, 1989) and Kingston et al. (1995) plots. These estimates should be viewed as very preliminary because the conversion equations used are still under development and are currently being tested and improved.

- Stem_Wood, Stem_Bark, Branch, and Foliage_Carbon (t ha^{-1}). These data were calculated by multiplying the corresponding biomass estimates by 0.5.

Horizon Table

The Horizon table contains chemical and physical information for each soil horizon (Table 7). Most of the data were provided by the contributor, but some values for percent carbon and bulk density had to be estimated.

No data were rejected because of differences between analytical approaches. In general, standard soil analysis techniques have changed little over the years, and similar approaches are reported in many soil analysis manuals (McKeague 1978; Kalra and Maynard 1991). Some cautionary remarks are included in the description of each field. For details of the original analytical techniques, readers should refer to the original sources.

Data for percent carbon, bulk density, and horizon thickness are required to calculate the carbon content of a soil horizon. Horizon thickness was available for all soil horizons, but percent carbon was missing for about 15% of the horizons, and bulk density was missing for about 78% of the horizons. Because a major objective of this database is to provide plot-level estimates of carbon stocks, it was necessary to establish a procedure for estimating substitution values for the missing data. The companion fields, Total_Carbon_Method and Bulk_Density_Method associated with Total_Org_Carbon_Percent estimates and Bulk_Density estimates respectively, indicate whether the value was estimated by the authors or measured by the contributor.

Typically, analyses for percent carbon were not done by the contributors when the horizons were thin or expected to have relatively low values for percent carbon (e.g., the Ae horizon). Although these horizons would not have a huge influence on the estimates of total soil carbon stocks, values were estimated and included in the FECD for the sake of completeness. Percent carbon in these cases was estimated using a mean value for similar horizons in the same soil taxonomic class. Means were estimated using data for measured percent carbon values in a combined database from the FECD and Siltanen et al. (1997). For example, if there was no analysis for percent carbon in the Ae horizon of an Eluviated Eutric Brunisol, the mean value for all Ae horizons of Eluviated Eutric Brunisols in the combined database was calculated and used as an estimate for the missing value.

Bulk density is a critical type of data required to calculate soil carbon content, but it was not routinely measured in previous soil inventories or research studies. Although predictive equations have been published to estimate bulk density, they are generally not intended for use outside the study or region in which they were developed (Grigal et al. 1989; Kaur et al. 2002). Therefore, a forest soil bulk density database of measured bulk densities, horizon name, and soil taxonomic classification (Soil Classification Working Group 1998) was compiled. Analysis of variance and planned contrasts (Petersen 1985) were used to determine statistically different groupings of soil horizons within soil orders in terms of bulk density. These results were used to produce a look-up table for bulk density substitution values for horizons where bulk density was not measured (Table 8). Data from Zoltai et al. (2000) were used to estimate look-up values for O horizons in organic soils (Table 8).

- Horizon (name): All horizon designations were checked for consistency with current definitions (Soil Classification Working Group 1998). Labels were updated or modified as required.
- Total_Org_Carbon_Percent: Most of the data in this field were provided as percent organic carbon values. If data were provided as percent organic matter or percent loss on ignition, Total_Org_Carbon_Percent was estimated by dividing the value by 1.725 for mineral soil horizons and by 2 for organic horizons (Nelson and Sommers 1982). Caution should be exercised in using Total_Org_Carbon_Percent values for soil horizons with pH above 6.5, where some unknown portion of the carbon analyzed might have been inorganic carbon. Where this might have been the case, all inorganic and organic carbon data were extracted and examined. Inorganic carbon data were available for a small subset (36) of B and C horizons, and the values ranged from 0% to 2.8%. An examination of horizons with pH above 6.5 where only organic carbon analyses were reported showed that, in general, values for percent organic carbon were low and in the range expected if little or no inorganic carbon had been included in the determination. In a very small percentage of the horizons, the values were high, indicating the possibility that the presence of inorganic carbon may have contributed to the high value. In these cases, the values for Total_Org_Carbon_Percent should be interpreted with caution.
- Total_Org_Carbon_Density (kg m^{-2}): Total carbon density was calculated for each horizon in the database using equation 3:

$$CD = \frac{TOC\%}{100} \times D_b \times TH \times 10 \qquad [3]$$

where CD is the total organic carbon density, TOC% is the total organic carbon (%), D_b is the bulk density (g cm^{-3}), TH is the horizon

Table 7. **Summary of fields in the Horizon table (maximum of 3547 records [horizons])**

Field name	Description	No. (and %) of records
Horizon_ID	Unique identifier, automatically assigned by database	3547 (100)
Horizon	Horizon name (Soil Classification Working Group 1998)	3547 (100)
Total_Org_Carbon_Percent	Total percent carbon as provided by contributor or as estimated by procedure described in this publication	3531 + 16R[a] (100)
Total_Org_Carbon_Density	Total carbon (kg m^{-2})	3531 + 16R (100)
Total_Nitrogen_Percent	Total percent nitrogen, as provided by contributor	2854 (80)
Total_Nitrogen_Density	Total nitrogen (kg m^{-2})	2854 (80)
C_N_Ratio	Total_Carbon_Percent/ Total_Nitrogen_Percent	2854 (80)
Total_Carbon_Method	"Estimated" if estimated by procedure described in this publication	537 (15)
	"Measured" if provided by contributor	2995 (84)
Carbonate_Carbon	Percent carbonate carbon	36 (1)
Available_Phosphorus	Extractable phosphorus (ppm)	2262 (64)
Available_Phosphorus_Method	Method for extractable phosphorus, as described by contributor	2262 (64)
PH_H2O	pH in water	700 (20)
PH_CaCl2	pH in $CaCl_2$	2808 (79)
CEC	Cation exchange capacity (cmol(+) kg^{-1})	2167 (61)
Calcium_Exchangeable	Exchangeable calcium (cmol(+) kg^{-1})	2167 (61)
Magnesium_Exchangeable	Exchangeable magnesium (cmol(+) kg^{-1})	2138 (60)
Sodium_Exchangeable	Exchangeable sodium (cmol(+) kg^{-1})	2085 (59)
Potassium_Exchangeable	Exchangeable potassium (cmol(+) kg^{-1})	2116 (60)
Phosphate_Ext_Al_Fe	Percent phosphate-extractable aluminum + iron	98 (3)
Upper_Horizon_Limit	Depth to top of horizon (cm)	3547 (100)
Horizon_Thickness	Thickness of horizon (cm)	3547 (100)
Bulk_Density	Bulk density (g cm^{-3})	3531 + 16R (100)
Bulk_Density_Method	"Estimated" if estimated using Table 8	2710 (76)
	"Measured" if provided by contributor	821 (23)
Coarse_Fragments	Box checked if coarse fragments accounted for in measured Bulk_Density	NA[b]
Sand	Percent sand	2046 (58)
Silt	Percent silt	2046 (58)
Clay	Percent clay	2070 (58)
Coarse_Fragments_Class	Coarse fragments class based on percent coarse fragments from visual estimates	758 (21)
Texture_Class	Texture class, based on percent sand, silt, and clay (Soil Classification Working Group 1998)	2046 (58)
Profile_ID	Unique identifier automatically assigned by database	3547 (100)

[a] R = rock or bedrock.

[b] NA = not applicable.

Table 8. Mean bulk density (Db) substitution values for various horizons and standard error of the mean (SE)

Horizons	Order	Great group	Sub group	Horizon	Db (g cm^{-3})	SE	n[a]
Organic							
	Brunisolic[b]	All	All	LFH	0.16	0.04	69
	Cryosolic	Insufficient data					
	Gleysolic	All	All	L, LF, LFH	0.08	0.04	5
				F	0.12	0.03	18
				FH, H	0.21	0.04	16
				Of, Om	0.13	0.05	17
				Oh	0.34	0.08	9
	Luvisolic	All	All	LFH	0.15	0.01	115
	Organic	All	All	Of	0.08	0.0007	2794
				Om	0.12	0.0006	3164
				Oh	0.15	0.002	1031
	Podzolic	Fera Humic, Humic	All	LFH	0.11	0.01	15
		Humo Ferric	All	LFH	0.14	0.02	48
	Regosolic	All	All	L, LF, LFH	0.11	0.03	14
				H, Hb	0.55	0.39	7
	Solonetzic	Use values for LFH of Luvisolic order					
A							
	Brunisolic	All	All	Ah, Ahe	1.07	0.11	18
				Ae	1.24	0.08	32
				All other A horizons	1.31	0.05	86
	Cryosolic	All	All	Ah, AB	1.34	0.13	11
				Ae	1.11	0.27	7
	Gleysolic	Gleysol	All	Ah, Ahg	1.03	0.15	28
				Ae, Aeg	1.39	0.10	17
		Luvic	All	Aeg	1.54	0.11	23
				All other A horizons	1.18	0.13	32
		Humic	Rego	Ah, Ahg	1.01	0.13	36
				All other A horizons	1.44	0.05	66
			Fera, Orthic	All	1.42	0.06	44
	Luvisolic	Gray	Brunisolic	Ah, Ahe	0.70	0.50	4
				Ae, AB	1.29	0.11	33
			Dark, Gleyed Dark	Ah	1.14	0.12	21
				AB, Ae	1.44	0.09	22
			Gleyed	Ah	1.01	0.33	9
				Ae, Aeg, AB	1.35	0.08	42
			Gleyed Brunisolic	All	1.25	0.18	19
			Podzolic, Gleyed Podzolic, Fragic	All	1.19	0.11	35
			Solonetzic, Gleyed Solonetzic	Ahe, Ae	1.25	0.19	8
				AB	1.52	0.20	5
		Gray Brown	Brunisolic	Ah	1.19	0.19	7
				Ae	1.25	0.11	19
			Gleyed	Ah	1.25	0.20	4
				Aeg	1.30	0.22	8

Table 8. **Continued**

Horizons	Order	Great group	Sub group	Horizon	Db (g cm^{-3})	SE	n^a
A	Luvisolic	Gray Brown	Gleyed Brunisolic	All	1.34	0.06	20
			Orthic	All	1.21	0.19	16
			Podzolic	All	1.30	0.25	3
	Podzolic	Fera Humic, Humic	All	All	0.93	0.13	19
		Humo Ferric	All	Ah, Ae, Aeg	1.31	0.15	8
				AB, Aex	1.18	0.05	111
	Regosolic	All	All	All	0.97	0.10	48
	Solonetzic	Use values for Solonetzic subgroup of Luvisolic order					
B	Brunisolic	Dystric	All	BC, Bm, Bt, Bg	1.45	0.07	96
				Bf horizons	1.03	0.13	21
		Eutric	Eluviated, Gleyed, Gleyed Eluviated	All	1.44	0.04	50
			Orthic	All	1.20	0.05	48
		Melanic	All	All	1.43	0.05	21
		Sombric	All	All	1.62	0.11	10
	Cryosolic	All	All	Bmy	1.86	0.44	5
				All other B horizons	1.40	0.10	34
	Gleysolic	Gleysol	All	All	1.56	0.07	43
		Humic	Fera, Orthic	All	1.42	0.06	44
			Rego	All	1.44	0.05	66
		Luvic	All	All	1.70	0.05	59
	Luvisolic	Gray	Brunisolic	Bf, Bm	1.26	0.12	37
				BC, Bt	1.53	0.09	29
			Dark, Gleyed Dark	All	1.49	0.07	37
			Gleyed	All	1.42	0.07	59
			Gleyed Brunisolic	All	1.51	0.14	38
			Orthic	All	1.44	0.03	148
			Podzolic, Gleyed Podzolic, Fragic	BC, Bt, Btg, Bx	1.65	0.05	61
				Bf, Bfg, Bfh	1.02	0.07	41
			Solonetzic, Gleyed Solonetzic	All	1.39	0.05	32
		Gray Brown	Brunisolic	Bm	1.40	0.05	17
				Bt	1.47	0.06	14
			Gleyed	All	1.51	0.10	11
			Gleyed Brunisolic	All	1.48	0.05	34
			Orthic	Bm, Bt	1.36	0.09	19
				BC	1.85	0.63	2
			Podzolic	All	1.61	0.14	8
	Podzolic	Ferro Humic, Humic	All	Bf	1.17	0.11	24
				Bfh, Bhf	0.86	0.09	34
				BC, BCc, Bx	1.71	0.10	17
		Humo Ferric	Fragic , Sombric, Orstein, Duric	Bm, Bx	1.70	0.15	11
				BC, Bf	1.38	0.12	12
		Humo Ferric	Orthic	Bm, Bt, BC, BCc, BCg, Bx	1.19	0.04	79
				Bfc, Bfg, Bf	1.46	0.05	99

Table 8. Concluded

Horizons	Order	Great group	Sub group	Horizon	Db (g cm^{-3})	SE	n[a]
B	Podzolic	Humo Ferric	Orthic	Bhf, Bfh	0.87	0.07	41
			Gleyed	BC, Bcg	1.57	0.16	13
	Regosolic[c]	All	All	Gleyed B horizons	1.27	0.06	88
				Nongleyed B horizons	1.10	0.07	59
	Solonetzic	Use values for Solonetzic subgroups of Luvisolic order					
C							
	Brunisolic	Dystric	Eluviated, Gleyed, Orthic	All	1.38	0.10	48
			Gleyed Eluviated	All	1.76	0.08	26
		Eutric	Eluviated, Gleyed, Gleyed Eluviated	All	1.52	0.04	34
			Orthic	All	1.29	0.07	29
		Melanic	All	All	1.50	0.16	10
		Sombric	All	All	1.84	0.18	7
	Cryosolic	All	All	C and Cg	1.54	0.12	13
				Cy and Cz	1.92	0.22	9
	Gleysolic	Gleysol	Fera, Orthic	Cg	1.71	0.07	38
				All other C horizons[d]	1.26	0.29	5
			Rego	Cg	1.42	0.07	42
				All other C horizons	1.26	0.29	5
		Humic	Fera, Orthic	All	1.66	0.10	25
			Rego	All	1.44	0.05	66
		Luvic	All	All	1.78	0.09	33
	Luvisolic	All	Brunisolic	All	1.58	0.08	39
			Gleyed Brunisolic	All	1.66	0.06	37
			Podzolic, Gleyed Podzolic, Fragic	All	1.75	0.07	38
			All other subgroups	All	1.51	0.03	159
	Podzolic	Ferro Humic, Humic	All	All	1.74	0.10	22
		Humo Ferric	All	Gleyed subgroups and Cg horizons	1.78	0.04	57
				Cx	1.91	0.14	7
				All other C horizons	1.63	0.04	93
	Regosolic[c]	All	All	Gleyed C horizons	1.27	0.06	88
				Nongleyed C horizons	1.10	0.07	59
	Solonetzic	Use values for Solonetzic subgroups of Luvisolic order					

[a] n = number of samples used to estimate mean and SE.

[b] Organic horizons comprise LFH, Of, Om, Oh.

[c] Bulk density of B and C horizons of Regosolic soils were not statistically significantly different; therefore, substitution values for Gleyed B and C horizons and for Nongleyed B and C horizons are the same for these two types of horizon.

[d] Bulk densities of all C horizons other than Cg in Fera, Orthic, and Rego subgroups were not significantly different; these subgroups were therefore combined.

thickness (cm), and the factor of 10 converts units from grams per square centimeter to kilograms per square meter.

- Total_Nitrogen_Percent: The percent total nitrogen was entered only if provided by the contributor.
- Total_Nitrogen_Density (kg m^{-2}): Total nitrogen density was calculated using equation 4:

$$\mathrm{ND} = \frac{\mathrm{TN\%}}{100} \times D_\mathrm{b} \times \mathrm{TH} \times 10 \qquad [4]$$

  where ND is the total nitrogen density, TN% is the total nitrogen (%), D_b is the bulk density (g cm^{-3}), TH is the horizon thickness (cm), and the factor of 10 converts units from grams per square centimeter to kilograms per square meter.

- C_N_Ratio: Calculated as Total_Org_Carbon_Percent divided by Total_Nitrogen_Percent.
- Total_Carbon_Method (measured or estimated): This field indicates whether the value for percent carbon was estimated as described for Total_Org_Carbon_Percent or measured by the contributor.
- Carbonate_Carbon (% carbonate carbon): Data for percent calcium carbonate ($CaCO_3$) were provided by Halliwell and Apps (1997c) and Knapik et al. (1988, 1989). These values were converted to inorganic carbon using a conversion factor of 0.12 (the proportion of carbon in $CaCO_3$).
- Available_Phosphorus (ppm): This field reports the value for phosphorus extracted by the method described in Available_Phosphorus Method (see below) and considered to be available for plant growth. A wide variety of analytical techniques are used for determining available phosphorus, and users should clearly understand the methodologic differences when comparing values between different studies.
- Available_Phosphorus_Method: This field provides the name of the analytical method reported by the contributor as having been used to determine extractable phosphorus or the most likely procedure used (if not reported).
- pH_H2O: This field reports the pH value of a soil suspension in water, as provided by the contributor.
- pH_CaCl2: This field reports the pH value of a soil suspension in a calcium chloride solution, as provided by the contributor.
- CEC (cmol [+] kg^{-1}): This field reports the value for cation exchange capacity, as provided by the contributor.
- Calcium, Magnesium, Sodium, and Potassium_Exchangeable (cmol [+] kg^{-1}): These fields report the values for exchangeable calcium, magnesium, sodium, and potassium, as provided by the contributor.
- Phosphate_Ext_Al_Fe(%): This field reports the sum of the percent pyrophosphate-extractable aluminum and iron (McKeague 1978). This characteristic is commonly used to distinguish Podzolic soils from some other soil orders and to distinguish among Podzolic great groups (Soil Classification Working Group 1998).
- Upper_Horizon_Limit (cm): This field reports the value for the depth to the upper boundary of the horizon. For all soils except those in the Organic order and the Organic great group of the Cryosolic order, the boundary between the mineral and organic soil horizons was 0 cm. Upper horizon limits are negative for organic horizons and positive for mineral soil horizons. For soils in the Organic order and the Organic great group of the Cryosolic order, the surface is 0 cm, and all values are positive.
- Horizon_Thickness (cm): This field reports the thickness of the horizon. The depths of the soil profiles were standardized to 100 cm of mineral soil (plus the variable thickness of the overlying organic horizons) or a total of 100-cm depth for organic soils (Organic order, and Organic great group of the Cryosolic order). In cases where the pit was not dug to a depth of 100 cm, it was assumed that the lowermost horizon extended to 100-cm depth. In one case, it was necessary to extrapolate the depth of a Cumulic Regosol. In this instance the average values for percent carbon and bulk density for the multiple pairs of A and C horizons were used to describe a virtual A/C cumulic horizon that was extrapolated to 100-cm depth.
- Bulk_Density (g cm^{-3}): This field reports the value for bulk density in grams dry weight per cubic centimeter. Measured values were provided by the contributor. If the contributor corrected the bulk density by subtracting the weight of coarse fragments, the check box in the Coarse_Fragments field (see below) is checked. Otherwise, it must be assumed that the bulk density values were not corrected for coarse fragment content. For about 78% of the horizons, bulk density was not measured. In

those cases, it was estimated using information in Table 8.

- Bulk_Density_Method (measured or estimated): This field indicates whether the value in the Bulk_Density field was measured by the contributor or estimated using the information in Table 8.
- Coarse_Fragments (check box): A check indicates that the contributor corrected the bulk density value for the presence of coarse fragments (>2 mm diameter).
- Sand (%): This field reports the value for percent by weight of sand-sized particles (0.05–2 mm diameter)
- Silt (%): This field reports the value for percent by weight of silt-sized particles (0.002–0.05 mm diameter).
- Clay (%): This field reports the value for percent by weight of clay-sized particles (≤ 0.002 mm diameter).
- Coarse_Fragments_Class (one of four classes: <10%, 10–30%, 31–65%, >65%): The coarse fragments class is based on visual estimates in the field of the fraction of soil >2 mm in diameter (pebbles, stones, etc.).
- Texture_Class (some combination of S, Si, or C): The textural class was determined when data were available for percent sand (S), percent silt (Si), and percent clay (C) according to the criteria set out in the Canadian System of Soil Classification (Soil Classification Working Group 1998).

Profile Table

The Profile table contains only three fields. The sole purpose of the table is to link the profile of a plot (identified by the FECD_ID) to many horizons in the Horizon table. The two fields FECD_ID and PROFILE_ID facilitate this linkage. The third field provides the date (year) when the soil pit was described and sampled.

Detrital_Biomass_Density and Detrital_Carbon_Density Tables

The Detrital_Biomass_Density table (Table 9) contains biomass estimates for foliar litter, standing dead trees, and coarse and fine woody debris, if these data were available.

Only four plots had data for foliar litter biomass (Fyles 1986). Data for coarse and fine woody debris were available for the Halliwell and Apps (1997c) plots, and data for fine woody debris were available for the four Fyles (1986) plots. Estimates for biomass of standing dead trees were possible for some of the plots where dead trees were identified and their diameter was measured. Their height (if not measured) and biomass were estimated using the same equations and procedures as for live trees (see description for Total_Tree_Biomass field in Biomass_Carbon table [Table 6]).

The Detrital_Carbon_Density table contains fields that directly correspond to those in the Detrital_Biomass_Density table. The carbon estimate was calculated by multiplying the detrital biomass by 0.5.

Site_Management and Site_Disturbance Tables

The Site_Management (Table 10) and Site_Disturbance (Table 11) tables were created to hold data for the history of plot management and disturbance. No data of this type were available for the plots accepted into the database, but the tables were retained in the database structure to accommodate future data collection.

Table 9. Summary of fields in the Detrital_Biomass_Density table and the Detrital_Carbon_Density table (maximum of 706 records [plots])

Field name	Description	No. (and %) of records
Detrital_Biomass_Density_ID (or Detrital_Carbon_ Density_ID)	Unique identifier automatically assigned by database	307 (43)
Measurement_Date	Year when data were collected	307 (43)
Foliar_Litter	Foliar litter biomass or carbon (kg m^{-2})	4 (1)
Standing_Dead_Trees	Biomass or carbon of standing dead trees (kg m^{-2})	267 (38)
Fine_Woody_Debris	Biomass or carbon of woody debris <7 cm diameter (kg m^{-2})	94 (13)
Coarse_Woody_Debris	Biomass or carbon of woody debris >7 cm diameter (kg m^{-2})	90 (13)

Table 10. Summary of fields in the Site_Management table (maximum of 706 records [plots])

Field name	Description
Site_Management_ID	Unique identifier automatically assigned by database
FECD_ID	Same as in Site_Information table
Management	Type of management practice such as fertilization, thinning (drop-down menu provides choices)
Management_Year	Estimated year of management practice
Management_Extent	Extent, expressed as percent of total area

Table 11. Summary of fields in the Site_Disturbance table (maximum of 706 records [plots])

Field name	Description
Site_Disturbance_ID	Unique identifier automatically assigned by database
Disturbance	Natural disturbance agents such as fire, wind, snow (drop-down menu provides choices)
FECD_ID	Same as in Site_Information table
Disturbance_Year	Estimated year of disturbance
Extent	Extent, expressed as percent of total area
Tree_Mortality	Extent of tree mortality, expressed as percent (based on Mortality_ Basis)
Mortality_Basis	Basis for Tree_Mortality estimate (drop-down menu provides the following options: VL = volume, BA = basal area, CA = crown area, ST = stem number, AR = area)
Specific_Disturbance_Agent	Comment field for details about disturbance agent

A copy of the FECD template is included on the compact disk for individuals who want to use the database structure to create their own compilation or to record and organize their own research data. The database structure and interface facilitate entry of measurements repeated over time. To use the FECD template Microsoft Access (Microsoft 2000a) must be installed on the user's computer.

Creating a New Database and Initiating Plot Records

1. Look at the READ-ME-FIRST document on the accompanying disk for instructions on installing the template on your hard drive.
2. Double-click on the template icon to bring up the "Site Description" form of the data entry interface (Fig. 4). Do not click on any of the six tabs displayed across the top of the form until after the database has been initiated (by initiating a record for your first plot using the "Site Description" form, following the procedure outlined below).
3. When a new plot is added to the database, the "Plot Identification" box located in the upper left-hand corner of the "Site Description" form must be completed first (Fig. 4). The "Source ID" and "Data Source" fields must be filled in by the user to complete the plot record initialization. The "Data Source" might be the name of an individual researcher or research project, whereas the "Source ID" field should be used for the plot name and must be unique. Enter the year the plot was established in the "Established" field. The entire field must be highlighted to enter the four digits for the year.
4. To initiate a record for subsequent plots, click on the right arrow next to the "Record" box in the lower left-hand corner of the screen (Fig. 4). A new "Site Description" form should appear so that a record can be initiated for the next plot.
5. Once records have been initiated for more than one plot, there are several ways to use the interface to move between plots. The "Record Lookup" box can be used to search plots by their Source ID by typing in the search term, and clicking on the "Search" button. Alternatively, the browse buttons next to the "Record" box in the lower left-hand corner of the screen can be used to move between plots (Fig. 4). The "Record Lookup" box and the "Record" browse buttons appear on every form associated with each of the six tabs.

"Site Description" Form

Once the plot record is initialized, the remaining fields on the "Site Description" form can be filled in. For several fields, convenient drop-down boxes are provided to facilitate rapid and consistent data entry.

1. The "Ecological Classification" box, located on the left-hand side of the "Site Description" form provides drop-down boxes to enter the names of the terrestrial ecozone and ecoregion (Fig. 4). The terrestrial ecozone name must be selected first; the appropriate subset of ecoregion names then becomes available in the "Terrestrial Ecoregion" drop-down box.
2. The "Order" and "Subgroup/Great Group" drop-down boxes in the "Soil Information" box operate in the same way. The order must be selected first; the appropriate subset of combined subgroup and great group names then becomes available.
3. The "Vegetation Information" box on the right-hand side of the form provides drop-down boxes that allow selection of three combined genus and species codes for each vegetation layer. The choices must be entered in sequence from Species 1 to Species 3. The question-mark button located to the right of the boxes for each vegetation type provides access to a complete list of the genus and species names available in the database and their codes. If the required species name is not on the list, a new name and code can be added to the bottom of the appropriate vegetation type table (see Table 4, the list of accessory tables). The new name should appear in the appropriate drop-down box of the data entry form.
4. Other types of data can be entered by tabbing through the remaining five forms (described below). Data entered into the "Plot Identification" and "Location Data" boxes on the "Site Description" form will automatically appear on the other forms.

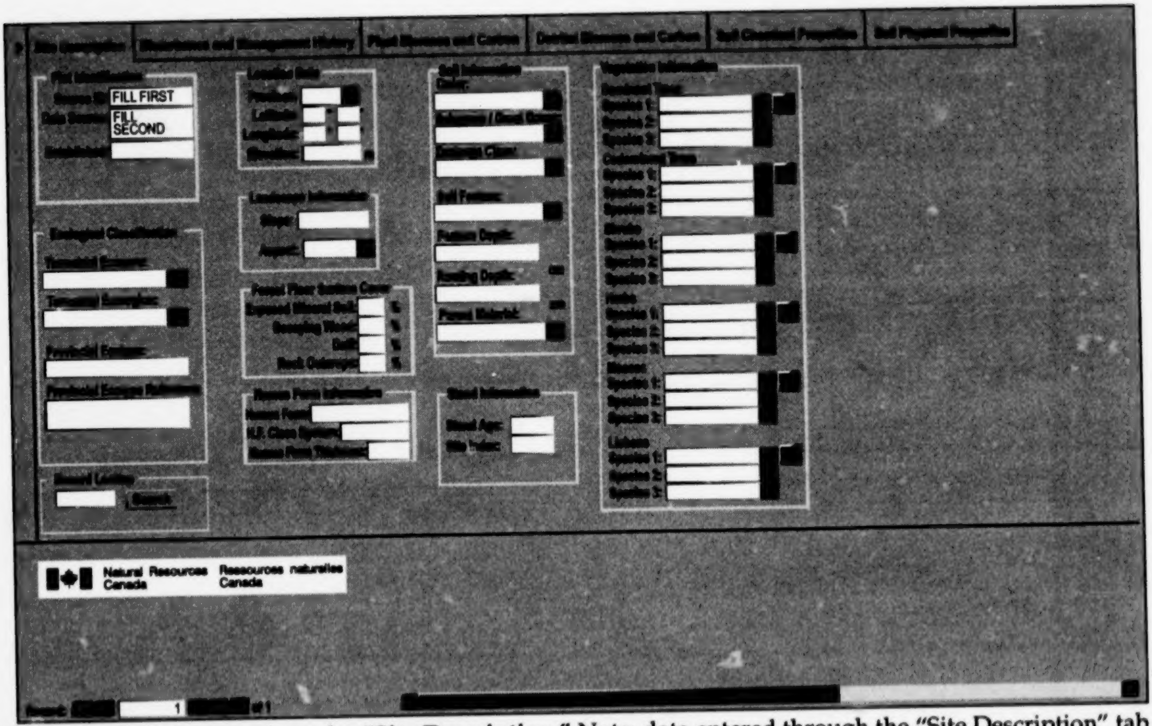


Figure 4. Data entry form for "Site Description." Note: data entered through the "Site Description" tab appears on the "Site Information" table.

"Disturbance and Management History" Form

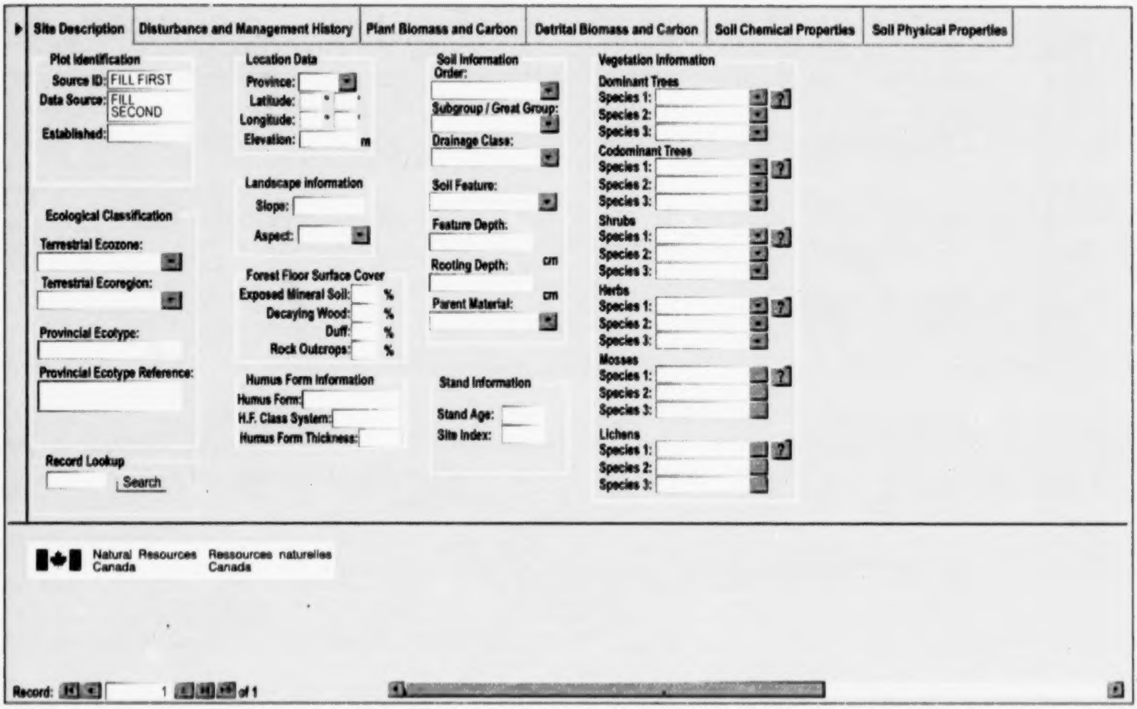
There are two buttons on the "Disturbance and Management History" form, one for each type of history. Clicking on the "Management History" button brings up the "Site Management History" window (Fig. 5). Each row within the "Site Management History" window can be used to enter data for a different "Management Event" to describe the history for that plot (Fig. 5). Browse buttons are provided within the "Site Management History" window to facilitate browsing between records within the window. These are different from the browse buttons in the lower left-hand corner of the screen, which facilitate browsing between plots. Clicking on the "Disturbance History" button brings up a window similar to that for "Site Management History" but for natural disturbances.

"Plant Biomass and Carbon" Form

The "Plant Biomass and Carbon" data entry form offers four buttons ("Stand Values," "Understory Cover," "Biomass," and "Carbon"), which bring up forms for entry of different types of stand-level data for aboveground vegetation. Like the "Disturbance and Management History" form, each row within each of the four forms can be used to enter measurements made on different dates for the same plot. For example, if stand basal area was measured in 1960, again in 1965, and so on, the measurement obtained in each year would be entered in a different row. No drop-down boxes are provided, and all data must be entered directly by the user.

"Detrital Biomass and Carbon" Form

The "Detrital Biomass and Carbon" data entry form is similar in structure to the "Plant Biomass and Carbon" form, but it has only two buttons: one for biomass and one for carbon. The fields in each form are for the measurement date, foliar litter, standing dead biomass, fine woody debris, and coarse woody debris. Data from repeated measurements can be entered as separate records in different rows. No drop-down boxes are provided, and all data must be entered directly by the user.


Site Description
Disturbance and Management History
Plant Biomass and Carbon
Detrital Biomass and Carbon
Soil Chemical Properties
Soil Physical Properties
Plot Identification
Established:
Ecological Classification
Terrestrial Ecozone:
Terrestrial Ecoregion:
Provincial Ecotype:
Provincial Ecotype Reference:
Record Lookup
Search
Location Data
Province:
Latitude:
Longitude:
Elevation:
m
Landscape information
Slope:
Aspect:
Forest Floor Surface Cover
Exposed Mineral Soil:
%
Decaying Wood:
%
Duff:
%
Rock Outcrops:
%
Humus Form Information
Humus Form:
H.F. Class System:
Humus Form Thickness:
Soil Information
Order:
Subgroup / Great Group:
Drainage Class:
Soil Feature:
Feature Depth:
Rooting Depth:
cm
Parent Material:
cm
Stand Information
Stand Age:
Site Index:
Vegetation Information
Dominant Trees
Species 1:
Species 2:
Species 3:
Codominant Trees
Species 1:
Species 2:
Species 3:
Shrubs
Species 1:
Species 2:
Species 3:
Herbs
Species 1:
Species 2:
Species 3:
Mosses
Species 1:
Species 2:
Species 3:
Lichens
Species 1:
Species 2:
Species 3:
Natural Resources Canada
Ressources naturelles Canada
Record:
1
of 1

Source ID: FILL FIRST

Data Source: FILL SECOND

Figure 4. **Data entry form for "Site Description."** Note: data entered through the "Site Description" tab appears on the "Site Information" table.

"Disturbance and Management History" Form

There are two buttons on the "Disturbance and Management History" form, one for each type of history. Clicking on the "Management History" button brings up the "Site Management History" window (Fig. 5). Each row within the "Site Management History" window can be used to enter data for a different "Management Event" to describe the history for that plot (Fig. 5). Browse buttons are provided within the "Site Management History" window to facilitate browsing between records within the window. These are different from the browse buttons in the lower left-hand corner of the screen, which facilitate browsing between plots. Clicking on the "Disturbance History" button brings up a window similar to that for "Site Management History" but for natural disturbances.

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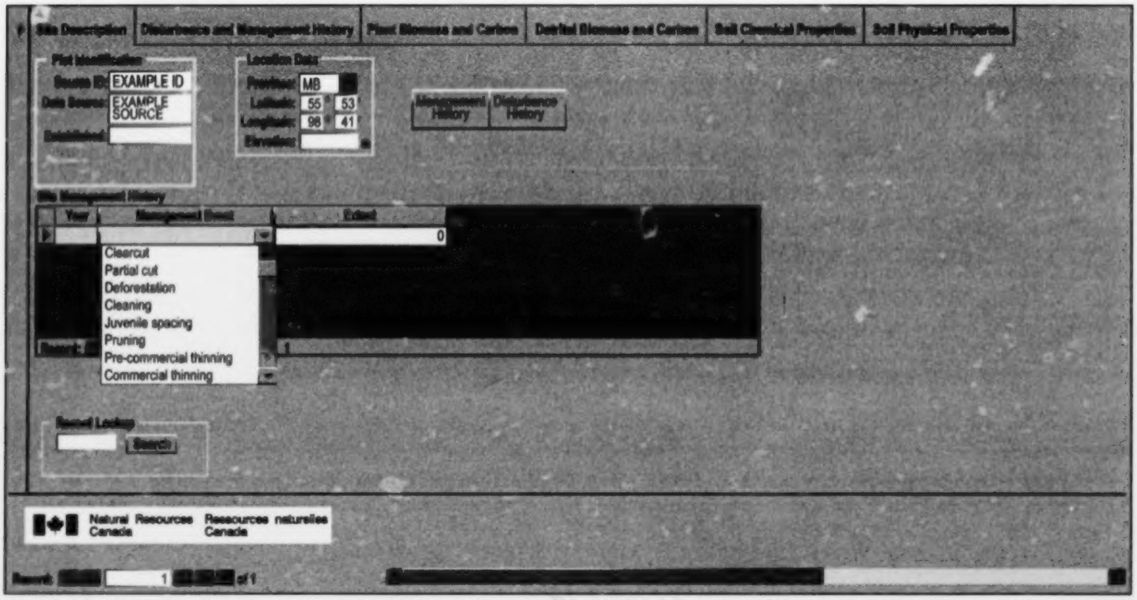
The "Detrital Biomass and Carbon" data entry form is similar in structure to the "Plant Biomass and Carbon" form, but it has only two buttons: one for biomass and one for carbon. The fields in each form are for the measurement date, foliar litter, standing dead biomass, fine woody debris, and coarse woody debris. Data from repeated measurements can be entered as separate records in different rows. No drop-down boxes are provided, and all data must be entered directly by the user.


Site Description
Disturbance and Management History
Plant Biomass and Carbon
Detrital Biomass and Carbon
Soil Chemical Properties
Soil Physical Properties
Plot Identification
Location Data
Management History
Disturbance History
Site Management History
Year
Management Event
Extent
Clearcut
Partial cut
Deforestation
Cleaning
Juvenile spacing
Pruning
Pre-commercial thinning
Commercial thinning
Record Lookup
Search
Natural Resources Canada
Ressources naturelles Canada

Source ID: EXAMPLE ID
Data Source: EXAMPLE SOURCE
Established:
Province: MB
Latitude: 55° 53'
Longitude: 98° 41'
Elevation:
Extent: 0
Record: 1 of 1

Figure 5. **Data entry form for "Disturbance and Management History," with the "Management History" window open.**

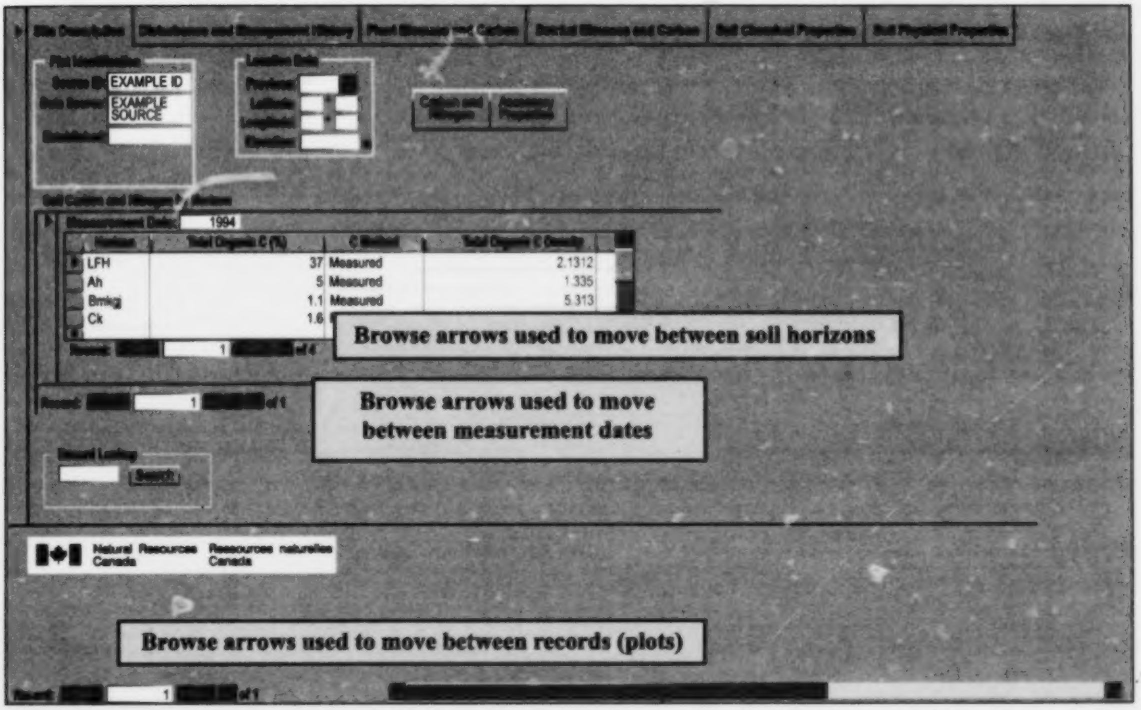
"Soil Chemical Properties" Form

The "Soil Chemical Properties" data entry form has two buttons leading to separate windows: one for soil carbon and nitrogen data (Fig. 6) and the other for "Accessory Properties" such as pH and exchangeable cations. The "Soil Carbon and Nitrogen by Horizon" window provides fields to enter the soil profile horizon names, total organic carbon (%), and total nitrogen (%). These are the only fields where numeric data can be entered. The "C Method" field provides a drop-down box with two choices: "Measured" and "Estimated." The database contains macros that automatically calculate total organic carbon density (kg m^{-2}) and total nitrogen density (kg m^{-2}) for the horizon, provided that the "Total Organic (%)" and "Total N (%)" fields are completed on this form and the fields for horizon thickness (cm) and bulk density (g cm^{-3}) are completed in the "Soil Physical Properties" data entry form. The carbon to nitrogen ratio is automatically calculated if the "Total Organic (%)" and "Total N (%)" fields are completed.

The horizon names entered on this form will automatically appear on the "Accessory Properties" form and the forms associated with the "Soil Physical Properties" tab. If the name of a horizon is changed on any of the soil profile horizon forms, it will automatically be changed on all the other forms.

The structure of the forms for soil data entry associated with the "Soil Chemical Properties" and "Soil Physical Properties" tabs is slightly different from the structure of forms associated with the "Disturbance and Management History," "Plant Biomass and Carbon," and "Detrital Biomass and Carbon" tabs. A record exists for each horizon on each measurement date. The browse arrows that appear immediately below the horizon names allow you to move between horizons (Fig. 6). In the example provided, the browser indicates that record 1 (LFH) of 4 (the four soil horizons) is selected (Fig. 6). The "Measurement Date" box located above the "Horizon" field name is used to enter the year when data were obtained. In the example, the data were collected in 1994 (Fig. 6). Another set of measurements obtained in a different year could be entered by clicking once on the right arrow for browsing between measurement dates (Fig. 6). A new entry form appears, so that the new measurement date (year) and the new data for that year can be entered.

The "Accessory Properties" button leads to a data input form for soil chemical properties such as pH and exchangeable cations. All data must be entered by the user, and fields are self-explanatory.


Site Description
Disturbance and Management History
Plant Biomass and Carbon
Detrital Biomass and Carbon
Soil Chemical Properties
Soil Physical Properties
Plot Identification
Location Data
Carbon and Nitrogen
Accessory Properties
Soil Carbon and Nitrogen by Horizon
Record Locator
Search
Natural Resources Canada
Ressources naturelles Canada

Source ID: EXAMPLE ID

Data Source: EXAMPLE SOURCE

Measurement Date: 1994

Horizon	Total Organic C (%)	C Method	Total Organic C Density
LFH	37	Measured	2.1312
Ah	5	Measured	1.335
Bmkgj	1.1	Measured	5.313
Ck	1.6		

Record: 1 of 4

Browse arrows used to move between soil horizons

Record: 1 of 1

Browse arrows used to move between measurement dates

Browse arrows used to move between records (plots)

Record: 1 of 1

Figure 6. Data entry form for "Soil Chemical Properties," with the "Carbon and Nitrogen" window open.

"Soil Physical Properties" Form

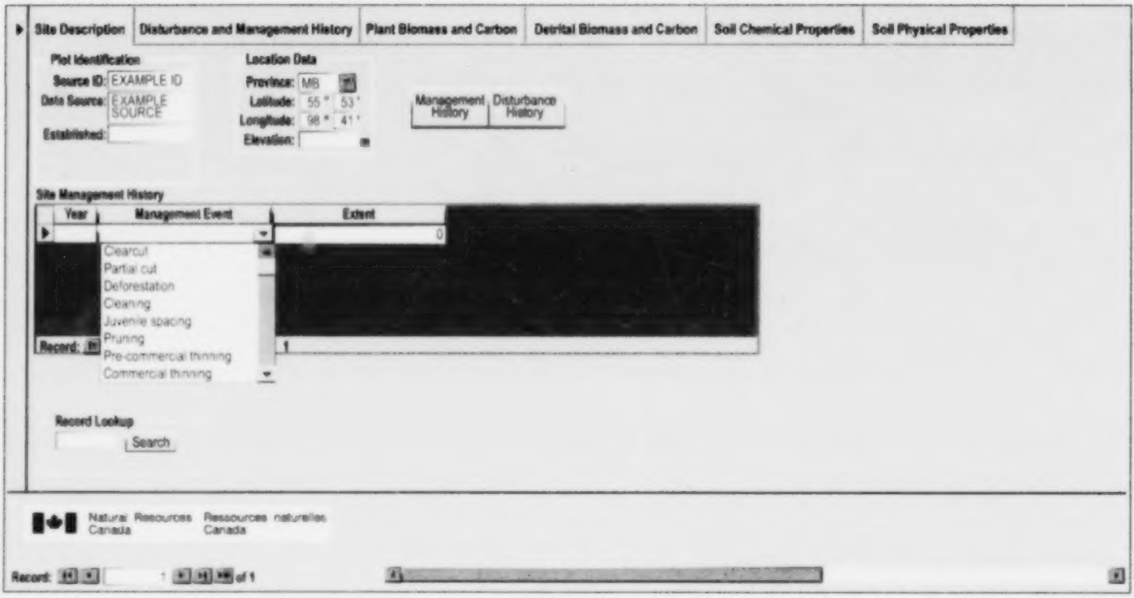
The "Soil Physical Properties" form has two buttons leading to data entry forms for "Soil Horizon Properties" (Fig. 7) and "Particle Size Analyses."

The "Soil Horizon Properties" form contains fields for horizon upper and lower depth limits, horizon thickness, and bulk density. A drop-down box offers two choices for bulk density method: "Estimated" and "Measured." A check box is used to indicate whether the bulk density estimate was corrected for the presence of coarse fragments (Fig. 7).

The "Particle Size Analyses" data entry form contains fields for percent sand, silt, and clay. The texture class is automatically determined by the database (Soil Classification Working Group 1998), provided that the percent sand, silt, and clay fields are completed and sum to 100% (Fig. 8). Four "Coarse Fragment Classes" are provided by a drop-down box (Fig. 8).

Importing Data

Other types of data files (e.g., Microsoft Excel or text files) can be directly imported into the tables. For details on importing and exporting files, please refer to the Microsoft Access (Microsoft 2000a) help files or a user's manual. However, it is best to become familiar with the database structure by entering individual plot data before importing large quantities of data.


Site Description
Disturbance and Management History
Plant Biomass and Carbon
Detrital Biomass and Carbon
Soil Chemical Properties
Soil Physical Properties
Plot Identification
Location Data
Management History
Disturbance History
Site Management History
Clearcut
Partial cut
Deforestation
Cleaning
Juvenile spacing
Pruning
Pre-commercial thinning
Commercial thinning
Record Lookup
Search
Natural Resources Canada
Ressources naturelles Canada

Source ID: EXAMPLE ID
Data Source: EXAMPLE SOURCE
Established:
Province: MB
Latitude: 55 ° 53 '
Longitude: 98 ° 41 '
Elevation: m

Year	Management Event	Extent
		0

Record: 1

Record: of 1

Figure 5. Data entry form for "Disturbance and Management History," with the "Management History" window open.

"Soil Chemical Properties" Form

The "Soil Chemical Properties" data entry form has two buttons leading to separate windows: one for soil carbon and nitrogen data (Fig. 6) and the other for "Accessory Properties" such as pH and exchangeable cations. The "Soil Carbon and Nitrogen by Horizon" window provides fields to enter the soil profile horizon names, total organic carbon (%), and total nitrogen (%). These are the only fields where numeric data can be entered. The "C Method" field provides a drop-down box with two choices: "Measured" and "Estimated." The database contains macros that automatically calculate total organic carbon density (kg m^{-2}) and total nitrogen density (kg m^{-2}) for the horizon, provided that the "Total Organic (%)" and "Total N (%)" fields are completed on this form and the fields for horizon thickness (cm) and bulk density (g cm^{-3}) are completed in the "Soil Physical Properties" data entry form. The carbon to nitrogen ratio is automatically calculated if the "Total Organic (%)" and "Total N (%)" fields are completed.

The horizon names entered on this form will automatically appear on the "Accessory Properties" form and the forms associated with the "Soil Physical Properties" tab. If the name of a horizon is changed on any of the soil profile horizon forms, it will automatically be changed on all the other forms.

The structure of the forms for soil data entry associated with the "Soil Chemical Properties" and "Soil Physical Properties" tabs is slightly different from the structure of forms associated with the "Disturbance and Management History," "Plant Biomass and Carbon," and "Detrital Biomass and Carbon" tabs. A record exists for each horizon on each measurement date. The browse arrows that appear immediately below the horizon names allow you to move between horizons (Fig. 6). In the example provided, the browser indicates that record 1 (LFH) of 4 (the four soil horizons) is selected (Fig. 6). The "Measurement Date" box located above the "Horizon" field name is used to enter the year when data were obtained. In the example, the data were collected in 1994 (Fig. 6). Another set of measurements obtained in a different year could be entered by clicking once on the right arrow for browsing between measurement dates (Fig. 6). A new entry form appears, so that the new measurement date (year) and the new data for that year can be entered.

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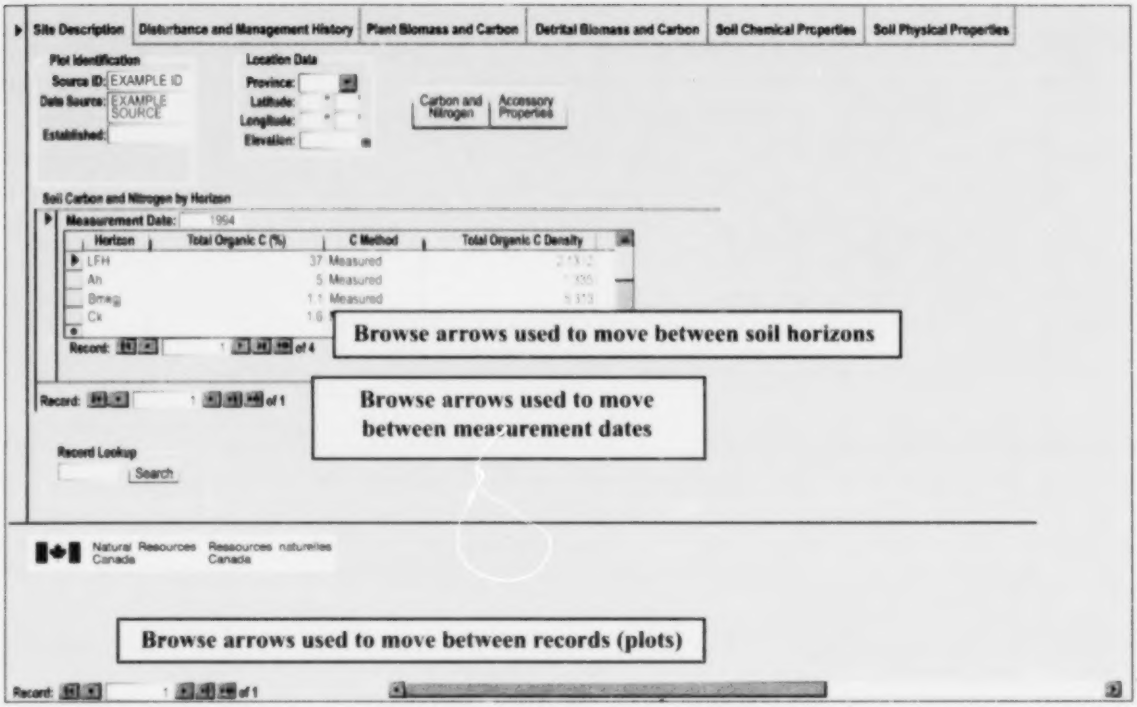
Site Description
Disturbance and Management History
Plant Biomass and Carbon
Detrital Biomass and Carbon
Soil Chemical Properties
Soil Physical Properties
Plot Identification
Location Data
Province:
Latitude:
Longitude:
Elevation:
Carbon and Nitrogen
Accessory Properties
Soil Carbon and Nitrogen by Horizon
Record Lookup
Search
Natural Resources Canada
Ressources naturelles Canada

Source ID: EXAMPLE ID
Data Source: EXAMPLE SOURCE
Established:

Measurement Date: 1994

Horizon	Total Organic C (%)	C Method	Total Organic C Density
LFH	37	Measured	[illegible]
Ah	5	Measured	[illegible]
Bmgj	1.1	Measured	[illegible]
Ck	1.6	[illegible]	[illegible]

Record: 1 of 4

Browse arrows used to move between soil horizons

Record: 1 of 1

Browse arrows used to move between measurement dates

Browse arrows used to move between records (plots)

Record: 1 of 1

Figure 6. Data entry form for "Soil Chemical Properties," with the "Carbon and Nitrogen" window open.

"Soil Physical Properties" Form

The "Soil Physical Properties" form has two buttons leading to data entry forms for "Soil Horizon Properties" (Fig. 7) and "Particle Size Analyses."

The "Soil Horizon Properties" form contains fields for horizon upper and lower depth limits, horizon thickness, and bulk density. A drop-down box offers two choices for bulk density method: "Estimated" and "Measured." A check box is used to indicate whether the bulk density estimate was corrected for the presence of coarse fragments (Fig. 7).

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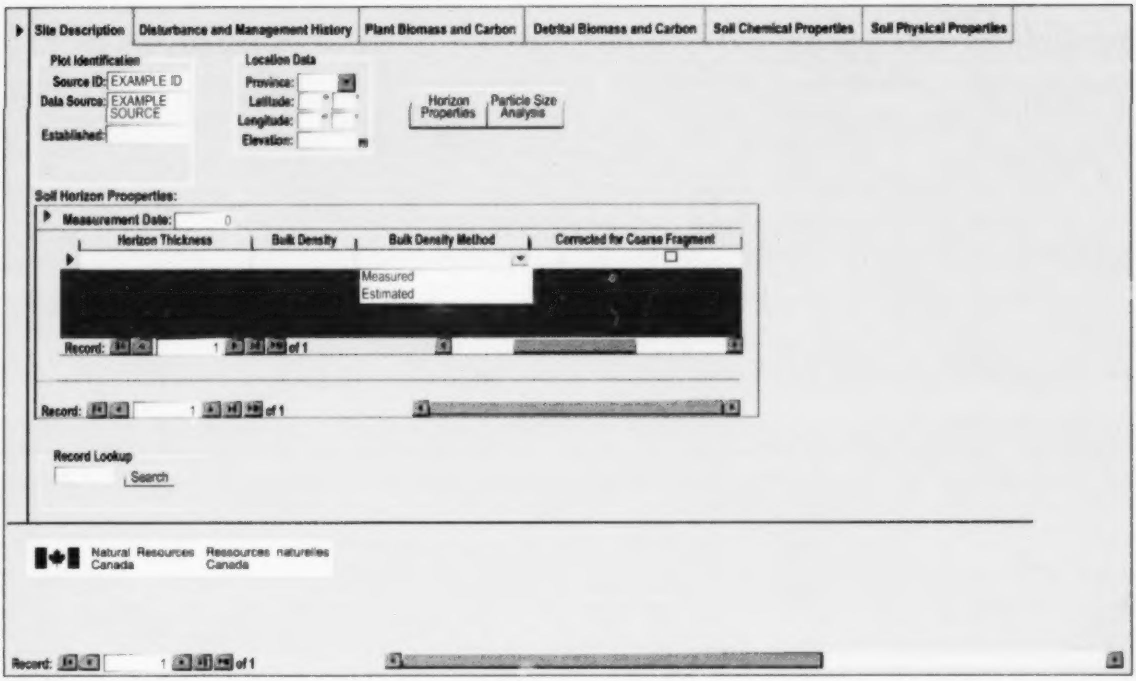
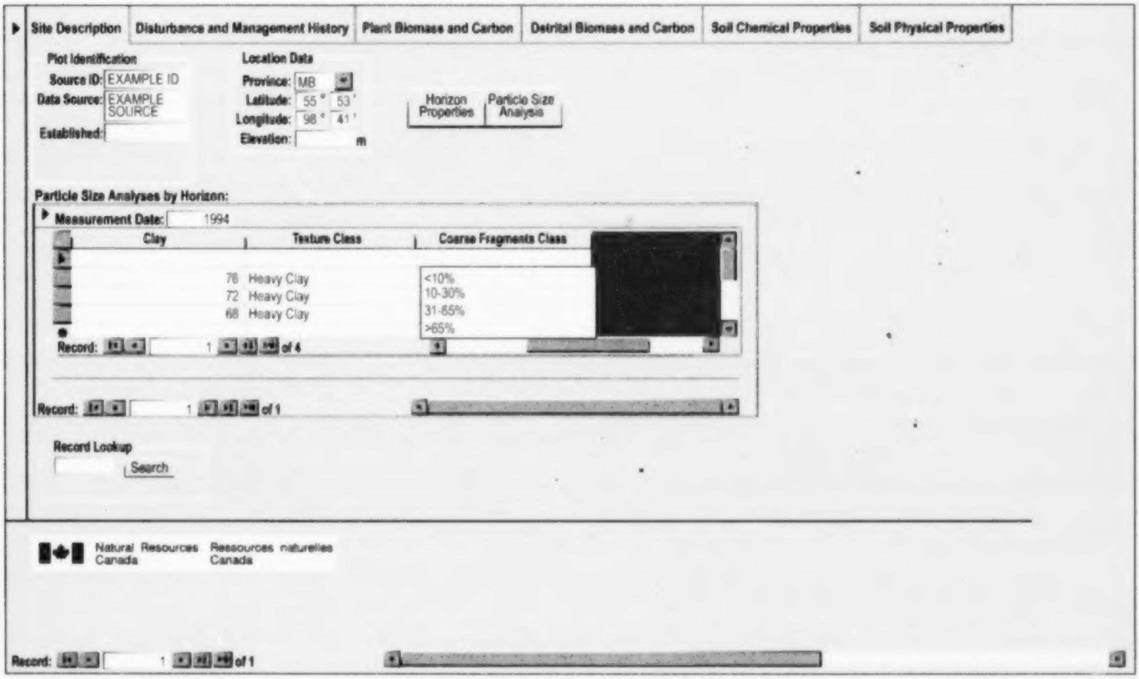

Site Description
Disturbance and Management History
Plant Biomass and Carbon
Detrital Biomass and Carbon
Soil Chemical Properties
Soil Physical Properties
Plot Identification
Location Data
Province:
Latitude:
Longitude:
Elevation:
m
Established:
Horizon Properties
Particle Size Analysis
Soil Horizon Proeperties:
Horizon Thickness
Bulk Density
Bulk Density Method
Corrected for Coarse Fragment
Measured
Estimated
Record:
of 1
Record Lookup
Search
Natural Resources Canada
Ressources naturelles Canada

Source ID: EXAMPLE ID

Data Source: EXAMPLE SOURCE

Measurement Date: 0

Figure 7. Data entry form for "Soil Physical Properties," showing the "Horizon Properties" window.


Site Description
Disturbance and Management History
Plant Biomass and Carbon
Detrital Biomass and Carbon
Soil Chemical Properties
Soil Physical Properties
Plot Identification
Location Data
Established:
Elevation:
m
Horizon Properties
Particle Size Analysis
Particle Size Analyses by Horizon:
<10%
10-30%
31-65%
>65%
Record:
of 4
of 1
Record Lookup
Search
Natural Resources Canada
Ressources naturelles Canada

Source ID: EXAMPLE ID

Data Source: EXAMPLE SOURCE

Province: MB

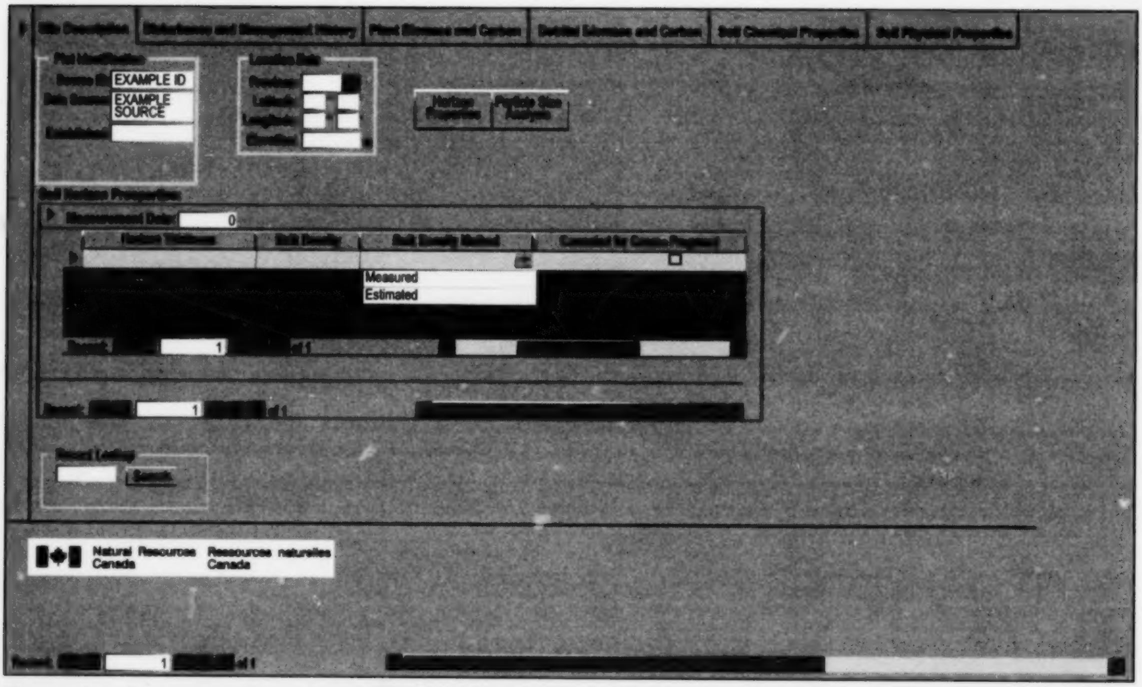
Latitude: 55° 53'

Longitude: 98° 41'

Measurement Date: 1994

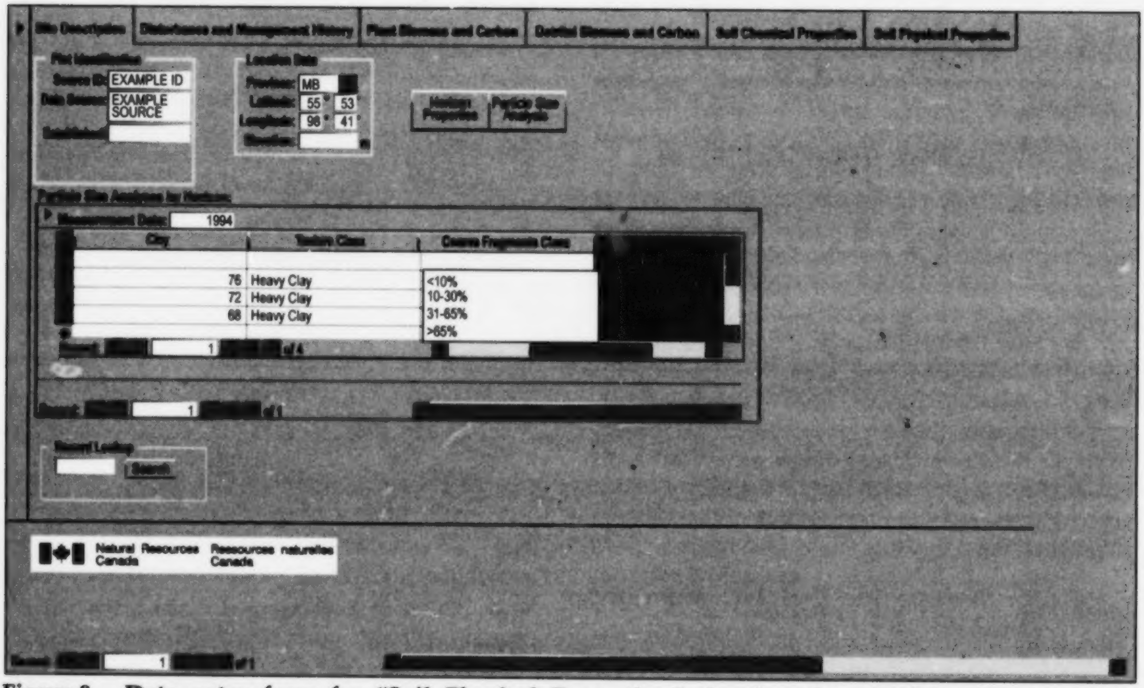
Clay	Texture Class	Coarse Fragments Class
76	Heavy Clay	
72	Heavy Clay	
68	Heavy Clay	

Figure 8. Data entry form for "Soil Physical Properties," showing the "Particle Size Analysis" window.


Site Description
Disturbance and Management History
Plant Biomass and Carbon
Detrital Biomass and Carbon
Soil Chemical Properties
Soil Physical Properties
Plot Identification
Location Data
Horizon Properties
Particle Size Analysis
Soil Horizon Properties
Horizon Thickness
Bulk Density
Bulk Density Method
Corrected for Coarse Fragment
Record Lookup
Search
Natural Resources Canada
Ressources naturelles Canada

Source ID: EXAMPLE ID
Data Source: EXAMPLE SOURCE
Measurement Date: 0
Bulk Density Method: Measured / Estimated
Record: 1 of 1

Figure 7. Data entry form for "Soil Physical Properties," showing the "Horizon Properties" window.


Site Description
Disturbance and Management History
Plant Biomass and Carbon
Detrital Biomass and Carbon
Soil Chemical Properties
Soil Physical Properties
Plot Identification
Location Data
Horizon Properties
Particle Size Analysis
Particle Size Analyses by Horizon:
Record Lookup
Search
Natural Resources Canada
Ressources naturelles Canada

Source ID: EXAMPLE ID
Data Source: EXAMPLE SOURCE
Province: MB
Latitude: 55° 53'
Longitude: 98° 41'
Measurement Date: 1994

Clay	Texture Class	Coarse Fragments Class
76	Heavy Clay	<10%
72	Heavy Clay	10-30%
68	Heavy Clay	31-65%
		>65%

Record: 1 of 4

Record: 1 of 1

Figure 8. Data entry form for "Soil Physical Properties," showing the "Particle Size Analysis" window.

EVALUATION OF TOTAL ECOSYSTEM CARBON

The following summary and discussion of large-scale comparisons and trends is provided as an example of the type of analysis than can be achieved with the database. The reader must be aware that the summary provided here is not the result of a comprehensive analysis of data in the FECD at the scale of individual plots. Rather, descriptive statistics at the scale of terrestrial ecozones or ecoclimatic provinces are provided for stand age and for carbon stocks in soil organic horizons, soil mineral horizons (to 100-cm depth), and live tree biomass. Total ecosytem carbon is reported as the sum of live tree biomass carbon plus carbon in the mineral and organic soil horizons. Estimates of carbon stocks for individual plots summarized in this evaluation are found in Appendix 3. Pearson correlation coefficients were determined for some of the variables to illustrate relationships at a large scale.

In the evaluation, no estimates are provided for detrital carbon (e.g., coarse woody debris, standing dead trees), which can be an important component in the carbon budget of forested ecosytems and would be expected to influence the magnitude and variability of total ecosystem carbon estimates. Halliwell and Apps (1997c) estimated carbon (t ha^{-1}) for coarse and fine woody debris in plots located in the Boreal Plains and Boreal Shield ecozones. They concluded that, in general, the amount of carbon in the woody debris is less than that in the organic or mineral soil horizons. Conversely, similar estimates for plots on Vancouver Island in the Pacific Maritime ecozone, showed that detrital carbon constituted a significant proportion of total ecosystem carbon and that the proportion varied with stand age and site type (Trofymow and Blackwell 1998). Although the FECD contains some data for detrital carbon, it is not enough to justify estimation of means for comparison between terrestrial ecozones. The comprehensive National Forest Inventory (Natural Resources Canada 1999) currently under way will ensure that plot-level data are collected for the detrital component, as well as the aboveground vegetation and soils.

Means are reported only for ecozones where the appropriate data were available. For some of these ecozones, data were available for very few plots. The means reported should not be taken as representative of the ecozone as a whole, but rather as the means for plots for which data were provided. They should not be directly compared with site-specific results.

The Boreal Shield and Taiga Shield ecozones were divided into eastern and western parts because the west is typically colder and drier than the east; these subzones have been modeled separately (Kurz et al. 1992; Table 12). Before calculation of the summary statistics, the plots were divided into two groups: a relatively small group of plots with organic or wetland soils (Organic order and Organic Cryosol great group of the Cryosolic order) and a larger group of plots with mineral or upland soils.

Table 12. Mean temperature range and precipitation for various ecozones

	Mean temperature range (°C)			Mean annual precipitation (mm)
Terrestrial ecozone	Annual	Winter	Summer	
Taiga Plains (TP)	–10 to –1	–26 to –15	6.5 to 14	200 to 500
Western Taiga Shield (WTS)	–8 to 0	–11 to –24.5	6 to 11	200 to 500
Western Boreal Shield (WBS)	–4	>–20.5	11 to 15	>400
Atlantic Maritime (AM)	3.5 to 6.5	–8 to –2	13 to 15.5	900 to 1500
Mixedwood Plains (MP)	5 to 8	–2.5 to –7	16 to 18	720 to 1000
Boreal Plains (BP)	–2 to 2	–17.5 to –11	13 to 15.5	300 to 625
Pacific Maritime (PM)	4.5 to 9	–0.5 to 3.5	10 to 15	1500 to 3000
Montane Cordillera (MC)	0.5 to 7.5	–11 to –1	11 to 16.5	500 to 1500
Hudson Plains (HP)	–4 to –2	–19 to –16	10.5 to 11.5	400 to 800
Eastern Boreal Shield (EBS)	5.5	–1	11 to 15	>1000

Source: summarized from http://www.ccea.org/ecozones/terr.html.

Wetland Plots

Very few plots in the database are from wetland sites (soils in the Organic order and the Organic Cryosol great group of the Cryosolic order). Carbon estimates in this database are standardized to 100 cm depth and would underestimate carbon stocks for peatlands, which are typically 2–3 m in depth and may be up to 5 or 6 m in depth (Tarnocai and Lacelle 2001). The summary in this report is provided to illustrate a comparison between upland, transitional, and wetland sites. In-depth analysis of carbon stocks in the wetlands of Canada is provided elsewhere (Vitt et al. 2000; Tarnocai and Lacelle 2001).

Some comparisons can be made between upland and wetland sites in the Taiga Plains and Boreal Plains ecozones. Wetland plots in each of these ecozones were divided into two groups to distinguish sites that are transitional between uplands and wetlands. Transitional sites were defined as those with mineral soil horizons within the top 1 m and wetlands as soils that were organic throughout the 1-m depth. The ecosystem carbon of these groups was compared with that of the upland sites in the same ecozones (Figs. 9 and 10).

Average total ecosystem carbon and its distribution between components were similar for upland sites in both ecozones and for wetland sites in both ecozones (Fig. 9). As expected, wetland sites had the highest proportion of carbon in the organic horizons. In both ecozones tree biomass carbon was lower in the wetland plots, than in the upland plots, which may be due to a younger average stand age in the wetland plots in the Boreal Plains (Fig. 10) or (more likely) the low tree productivity in wetland sites that is commonly observed (Simpson et al. 1993). The main difference between the two ecozones was in the mineral soil carbon of the transitional plots, where the average value was higher for the Boreal Plains than the Taiga Plains (Fig. 9) because of the presence of A and B horizons with a relatively high percentage of carbon in some of the Boreal Plains plots. Mineral soils of the Taiga Plains plots had no A or B horizons but only C horizons with a relatively low percentage of carbon. This finding is consistent with the prevailing view that peatlands are older and soils younger in the northern range of peatlands (Taiga Plains), whereas peatlands are younger and soils older in the southern range of peatlands (Boreal Plains). Where soils are older, sufficient time has passed for pedological processes to result in the horizon development (presence of A and B horizons) that is evident in the Boreal Plains mineral soil under peat.

Upland Plots

Estimates from the FECD

Estimates for mean total ecosystem carbon for different terrestrial ecozones ranged from 113 t ha^{-1} in the Western Taiga Shield (WTS) to 487 t ha^{-1} in the Pacific Maritime ecozone (PM) (Fig. 11). Estimated means for mineral soil horizons ranged from 48 t ha^{-1} (WTS) to 387 t ha^{-1} (PM). Means for soil organic horizons ranged from 11 t ha^{-1} in the Mixedwood Plains (MP) to 63 t ha^{-1} in the Taiga Plains (TP), whereas those for live tree biomass ranged from 35 t ha^{-1} in the Western Boreal Shield (WBS) to 102 t ha^{-1} in the Boreal Plains (BP) (Fig. 11). In general, the highest relative contribution to total ecosystem carbon was from mineral soil (40–80%), followed by tree biomass (15–40%) and organic soil horizons (2–25%) (Fig. 12).

The terrestrial ecozones could be divided into two productivity groups on the basis of average tree biomass carbon (Fig. 13c). The low biomass carbon group, with less than 50 t ha^{-1}, included the WTS, WBS, and Hudson Plains (HP) ecozones. The high biomass carbon group, with average biomass carbon above 50 t ha^{-1}, included the BP, TP, Montane Cordillera (MC), Eastern Boreal Shield (EBS), MP, Atlantic Maritime (AM), and PM ecozones. Ecozones with low tree biomass carbon (Fig. 13c) also had low total ecosystem carbon (Fig. 11).

The average stand age for the different ecozones ranged from 31 years (PM) to 111 years (WTS, MC) (Fig. 13d). Research has shown that stand-level biomass is strongly correlated with stand age and disturbance history (Kurz and Apps 1999). Summary statistics from the FECD show that average stand age correlates with biomass carbon within the ecozone groups with low ($R^2 = 0.99$) and high ($R^2 = 0.54$) tree biomass carbon, but not across all ecozones. For example, the average stand age of 111 years (WTS, MC ecozones) corresponded with a biomass carbon value of 42 t ha^{-1} in the low biomass carbon group (WTS) and 95 t ha^{-1} in the high biomass group (MC); the average stand age of 62 years (WBS, MP ecozones) corresponded with a biomass carbon value of 35 t ha^{-1} in the low biomass carbon group (WBS) and 98 t ha^{-1} in the high biomass group (MP) (Figs. 13c, 13d).

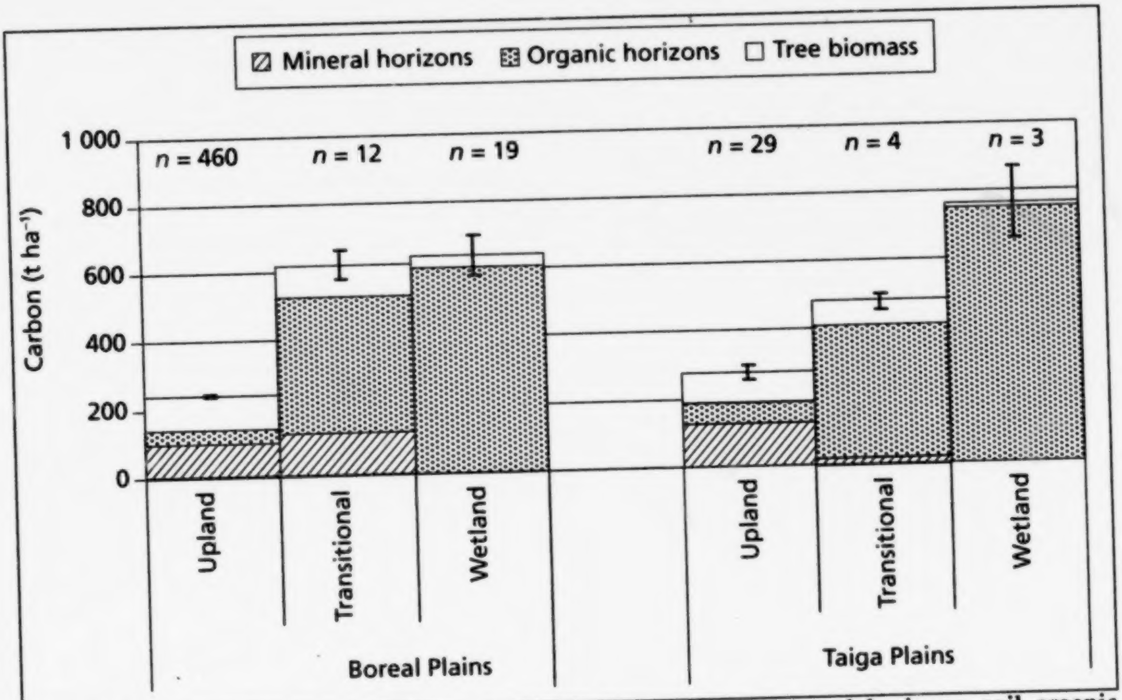


Figure 9. Distribution of total ecosystem carbon between soil mineral horizons, soil organic horizons, and tree biomass in upland, transitional, and wetland sites of the Boreal Plains and Taiga Plains ecozones. *n* = number of plots used to estimate the mean and standard error; standard error bar applies only to the total for each group.

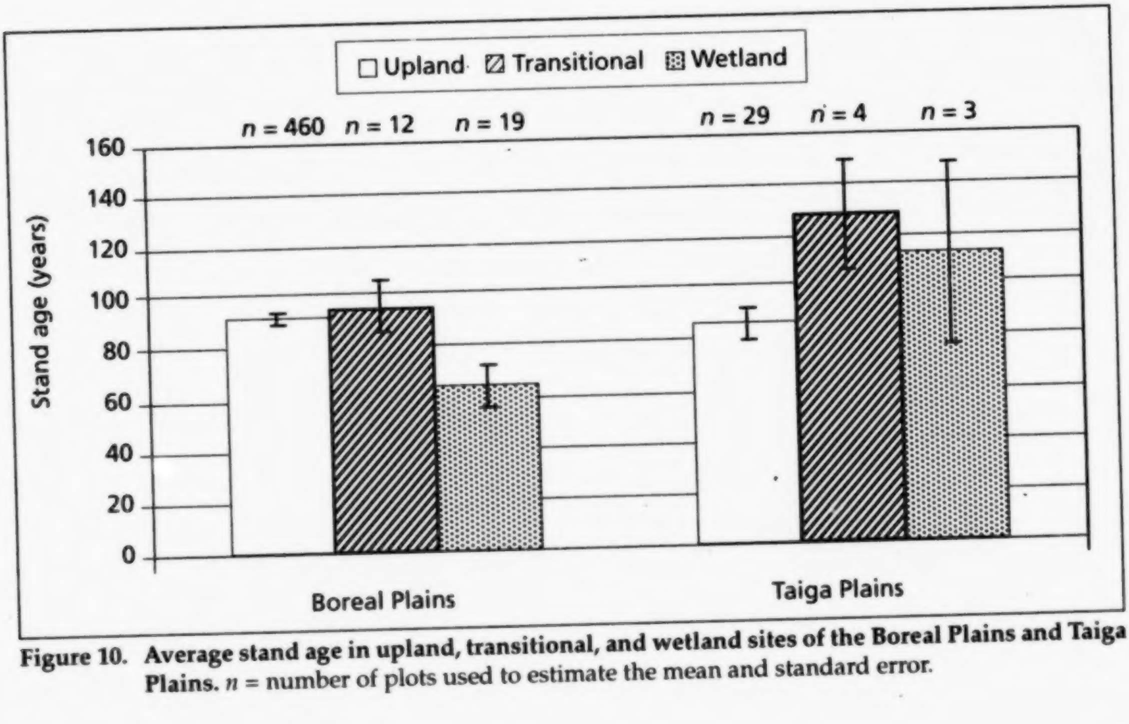


Figure 10. Average stand age in upland, transitional, and wetland sites of the Boreal Plains and Taiga Plains. *n* = number of plots used to estimate the mean and standard error.

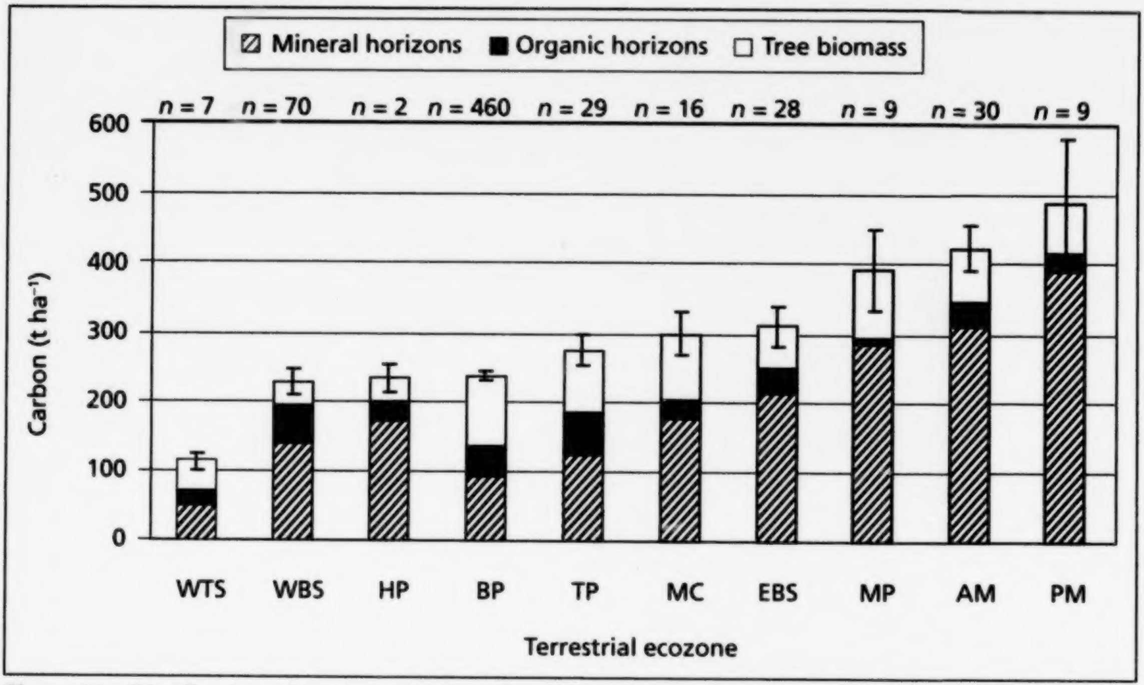


Figure 11. Distribution of total ecosytem carbon between soil mineral horizons, soil organic horizons, and tree biomass in the various terrestrial ecozones. *n* = number of plots used to estimate the mean and standard error; standard error bar applies only to total ecosystem carbon for each ecozone. WTS = Western Taiga Shield, WBS = Western Boreal Shield, HP = Hudson Plains, BP = Boreal Plains, TP = Taiga Plains, MC = Montane Cordillera, EBS = Eastern Boreal Shield, MP = Mixedwood Plains, AM = Atlantic Maritime, and PM = Pacific Maritime.

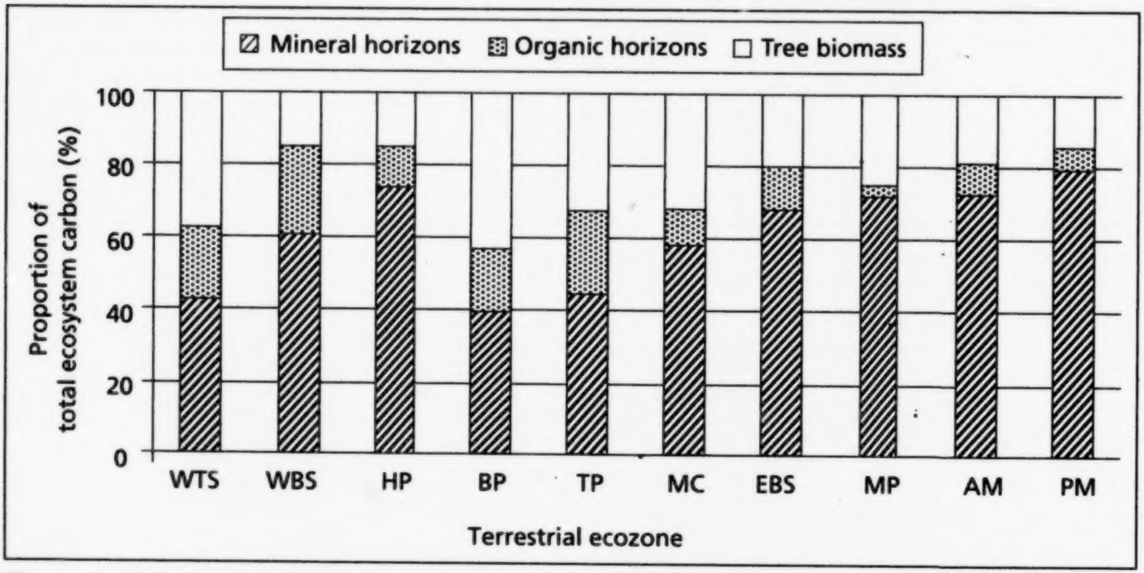


Figure 12. Relative contribution of mineral horizon soil carbon, organic horizon soil carbon, and tree biomass carbon to total ecosystem carbon. WTS = Western Taiga Shield, WBS = Western Boreal Shield, HP = Hudson Plains, BP = Boreal Plains, TP = Taiga Plains, MC = Montane Cordillera, EBS = Eastern Boreal Shield, MP = Mixedwood Plains, AM = Atlantic Maritime, and PM = Pacific Maritime.

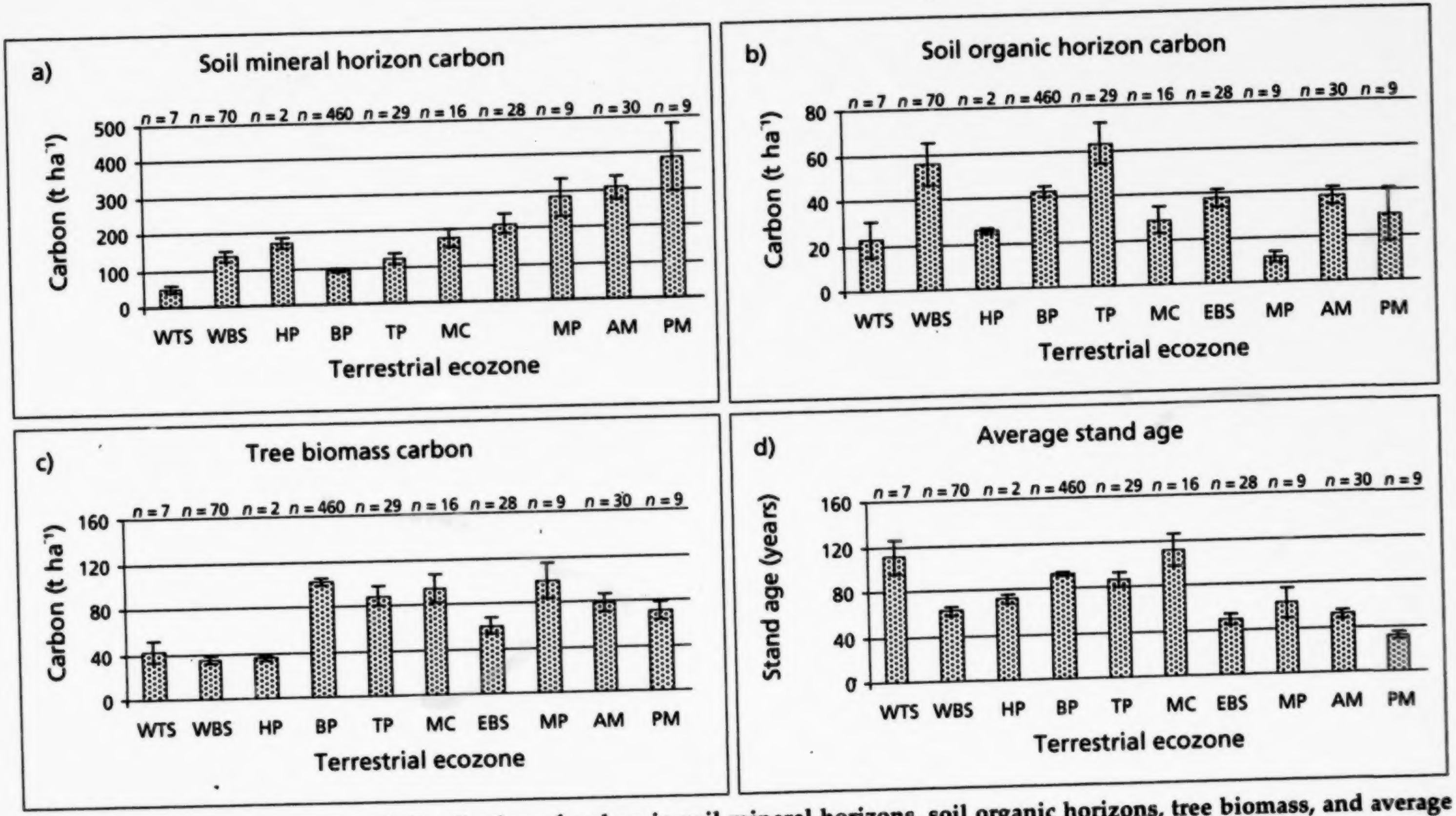


Figure 13. **Average stand age and distribution of carbon in soil mineral horizons, soil organic horizons, tree biomass, and average stand age for the various terrestrial ecozones.** WTS = Western Taiga Shield, WBS = Western Boreal Shield, HP = Hudson Plains, BP = Boreal Plains, TP = Taiga Plains, MC = Montane Cordillera, EBS = Eastern Boreal Shield, MP = Mixedwood Plains, AM = Atlantic Maritime, and PM = Pacific Maritime.

On average, mineral soil carbon contributes the largest quantity and proportion of carbon to total ecosystem carbon estimates (Figs. 11, 12, 13a). Although, as mentioned above, detrital carbon may be an important component contributing to total ecosystem carbon in some instances, there were insufficient data in the FECD to assess this contribution.

Within the low and high biomass carbon groups, the trend for increasing mineral soil carbon content roughly corresponded to climatic gradients from cold and wet to warm and dry (Fig. 13a, Table 12). Mineral soil carbon was correlated with mean annual precipitation within the high (R^2 = 0.77) and low (R^2 = 0.87) tree biomass groups. In the high tree biomass group, mineral soil carbon was correlated with mean winter temperature (MWT) (R^2 = 0.63), but not mean summer temperature (MST) (R^2 = 0.05), whereas the converse was true for the low tree biomass group (R^2 = 0.11 and 0.55 for MWT and MST, respectively). Mineral soil carbon was not correlated with mean annual temperature (MAT) in either tree biomass group.

Ecozones with the highest mineral soil carbon content had plots dominated by soils from the Podzolic order (EBS, AM, and PM ecozones), with high carbon content in the B horizons, or by Sombric and Melanic Brunisols and Gray Brown Luvisols (MP ecozone), with high carbon content in the A horizons. Ecozones within the high tree biomass carbon group but with lower mineral soil carbon content (BP, TP, and MC ecozones) were dominated by Eluviated Brunisols and Gray Luvisols. Within the low biomass carbon group, mineral soil carbon in the WTS ecozone was much lower than for the WBS and HP ecozones. The WTS plots were dominated by Eluviated Dystric Brunisols, whereas the WBS and HP ecozones contained a significant number of plots with Regosols, Gleysols, and Gleyed Luvisols, in addition to the Eluviated Brunisols. These poorly drained soils are typically associated with higher carbon content because of low decomposition rates.

Average ecozone carbon content of the organic soil horizons was highly variable across ecozones (Fig. 13b) and did not correlate with mean stand age. In the high tree biomass group, organic horizon carbon was negatively correlated with MWT (R^2 = –0.51), MST (R^2 = –0.73), and MAT (R^2 = –0.74). In the low biomass group, organic horizon carbon was negatively correlated with MWT (R^2 = –1.00), positively correlated with MST (R^2 = 0.97), and not correlated with MAT (R^2 = –0.18).

Within the low tree biomass group, the estimated mean carbon content of the organic horizons for the WBS ecozone was higher than that for the HP or WTS ecozones. This may reflect the combined effects of poor drainage (indicated by the presence of Regosols, Gleysols, and Gleyed Luvisols), cold temperatures, and acidic parent materials of the Canadian Shield, all of which reduce decomposition rates. Within the high tree biomass group, the highest average carbon content of the organic horizons occurred in the TP ecozone (Fig. 13b) where the MAT and precipitation were the lowest (Table 12); these climatic features might have led to low decomposition rates and an accumulation of organic matter at the soil surface. Intermediate values for organic horizon carbon content in the BP ecozone may have been due to poor drainage conditions (indicated by the presence of Gleysols and Regosols); in the EBS, AM, and PM ecozones, intermediate values may have been due to the balance between the effect of acidic parent materials (which may reduce decomposition rates) and high mean annual precipitation and MAT (which may enhance decomposition rates). The lowest carbon content in the organic horizons occurred in the MP ecozone, which is consistent with pedogenic processes of the dominant soil types (Gray Brown Luvisols and Sombric and Melanic Brunisols) leading to a forest mull Ah humus form (Klinka et al. 1981). In these cases the activity of soil organisms results in the intermixing of organic and mineral horizons and a net reduction of organic matter at the mineral soil surface.

Comparison with Other Carbon Estimates

Previously published large-scale estimates for forest soil carbon (Tarnocai and Lacelle 1996; Siltanen et al. 1997) and forest ecosystem carbon (Kurz and Apps 1999) in Canada were stratified by ecoclimatic province (Ecoregions Working Group 1989), rather than by terrestrial ecozone (Ecological Stratification Working Group 1996) as in this report. To facilitate comparison between the FECD estimates and those previously published, maps for each classification system were examined to determine the approximate correspondence between ecoclimatic provinces and terrestrial ecozones (Table 13).

Table 13. Approximate correspondence between ecoclimatic provinces and terrestrial ecozones

Ecoclimatic province	Terrestrial ecozone(s)
Pacific Cordilleran (PC)	Pacific Maritime
Cool Temperate (CT)	Atlantic Maritime and Mixedwood Plains
Boreal East (BE)	Eastern Boreal Shield
Boreal West (BW)	Boreal Plains, Taiga Plains, Western Boreal Shield
Cordilleran (C)	Montane Cordillera
Interior Cordilleran (IC)	Montane Cordillera

The means presented in the figures are identified by ecoclimatic province, although this categorization is not strictly true for the FECD, for which means were drawn from the corresponding terrestrial ecozone means (Table 13). The FECD mean for the Cool Temperate ecoclimatic province was calculated as the straight mean of the Atlantic Maritime and Mixedwood Plains ecozones, as they are of approximately the same size. A weighted mean was calculated for the Boreal West ecoclimatic province to account for the large differences in the size of the three ecozones used in the calculation (Table 13).

The FECD estimates for total tree biomass carbon and total ecosystem carbon (based on plots) were compared with those predicted by the Carbon Budget Model of the Canadian Forest Sector 2 (CBM-CFS2) (Kurz et al. 1992; Kurz and Apps 1999), an inventory-based model of forest carbon stocks. The carbon stocks reported for a region are based on the averages of thousands of stands of all site productivity classes and ages, including recently disturbed stands that may not contain any biomass. Biomass carbon estimates were simulated based on model parameters derived from Canada's national biomass inventory (Bonnor 1985). Estimates of other ecosystem carbon pools, such as dead organic matter in detritus, coarse woody debris, and soil, were derived through simulation modeling. In contrast, FECD data represented an often small number of sample plots within the same geographic region. Because these were not sampled to be representative of populations stratified by ecozones or ecoclimatic provinces, the comparisons here are primarily for illustrative purposes.

The FECD estimates for soil carbon were compared with several other independent estimates. Two of the other estimates were based on plot-level data, one was based on pedological mapping, and the fourth was based on the CBM-CFS2, which was used for comparison of tree biomass and total ecosystem carbon estimates.

Plot-based estimates are shown for the Oak Ridge National Laboratory (ORNL, as reported in Siltanen et al. 1997) and from the Forest Soil Profile Carbon Database (FSPCD, Siltanen et al. 1997). Estimates from FECD, ORNL, and the Canadian Soil Organic Carbon Database (CSOCD) are all based on a standard depth of 100 cm for the mineral soil. The depths of mineral soil in the FSPCD (Siltanen et al. 1997) are highly variable, ranging from 3 to 101 cm, with approximately 30–40% of the profiles less than 50 cm deep. To standardize the depth for comparison with the other soil carbon estimates, a subset of sites with soil profiles 90 to 100 cm deep were extracted from the FSPCD, and means for the ecoclimatic provinces were recalculated.

Estimates derived from the CSOCD (Tarnocai and Lacelle 1996) were based on pedological maps. The CSOCD provided one estimate for a Boreal ecoclimatic province, whereas other databases provided two estimates, one each for eastern and western parts of the Boreal ecoclimatic province. The CSOCD estimate for the Boreal is high (550 t ha^{-1}) relative to the other estimates, as it includes many nonforested wetland areas. Bhatti et al. (2002) recently used the same approach as that used for the CSOCD to generate estimates for the forested areas in the Boreal ecoclimatic province in Alberta, Saskatchewan, and Manitoba (102.0, 82.0, and 107.0 t ha^{-1}, respectively). An average of these three values was used to represent the Boreal West for the CSOCD comparisons in this report. Thus, a total of six estimates for soil carbon are compared:

- ORNL (plot-based): as reported in Siltanen et al. (1997),
- FSPCD (plot-based): data from Siltanen et al. (1997); means based on a subset of data with mineral soil profiles 90–100 cm deep,

- CSOCD (map-based): data from Tarnocai and Lacelle (1996), with Boreal West estimate from Bhatti et al. (2002),
- FECD (plot-based): estimates from this database,
- GM: a grand mean estimated from ORNL, FSPCD, CSOCD, and FECD,
- CBM-CFS2 (model-based): modeled results from the Carbon Budget Model of the Canadian Forest Sector 2 (Kurz and Apps 1999).

In general, the observed similarities and differences between model-based and plot-based estimates for ecosystem carbon were as expected. Modeled estimates for total ecosystem carbon were within the 95% confidence interval estimated using data from the FECD for the six ecoclimatic provinces that were compared (Fig. 14).

Estimates of total soil carbon stock were largely determined by mineral soil carbon, which accumulates over a longer time frame than that for stand development (from 60 to 300 or 400 years). The inherently low variability of mineral soil carbon on a large scale is reflected in the relatively good agreement between the estimates for mean total soil carbon regardless of the approach and between the grand mean and modeled results (Fig. 15).

Conversely, tree biomass, as well as the detrital pools (such as coarse woody debris) and soil organic horizons, which are largely derived from tree biomass, is highly variable over the course of stand development (represented by stand age) and is responsive to site quality and disturbance type (e.g., fire, insects, harvesting) and frequency. Thus, it might be expected that plot-level estimates, especially those based on a low sample size (as for the Pacific Cordilleran ecoclimatic province), which are likely biased in some way, would exhibit high variability in biomass carbon estimates (Fig. 16). Inventory or research plots of the type included in the FECD are typically installed to represent a specific ecotype or to measure trees in commercially productive forest. In the latter situation, tree biomass estimates may be biased toward mature, productive forests, tending to underrepresent young or unproductive forests; when young and unproductive forests are included, the estimate of mean biomass carbon should be lower. Models such as CBM-CFS2 attempt to simulate the influences of large-scale disturbances by fire, insects, and harvesting, which tend to reduce stand age and therefore lower biomass carbon estimates. As a consequence, there is relatively poor agreement between means for tree biomass carbon estimated from plots and modeled results (Fig. 16).

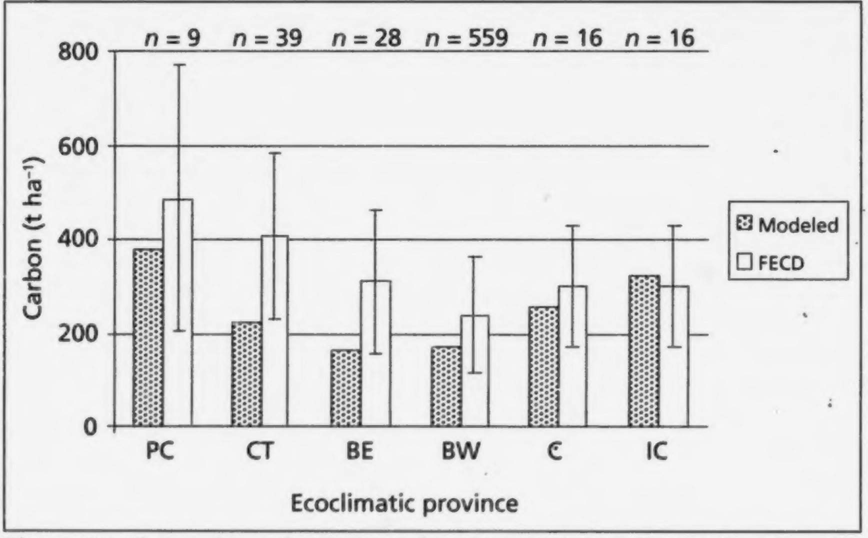


Figure 14. Comparison of estimates of average total ecosystem carbon from the Forest Ecosystem Carbon Database (FECD) and the Carbon Budget Model of the Canadian Forest Sector 2 model (Kurz and Apps 1999). *n* = number of plots used to estimate the mean and standard deviation. PC = Pacific Cordilleran, CT = Cool Temperate, BE = Boreal East, BW = Boreal West, C = Cordilleran, and IC = Interior Cordilleran.

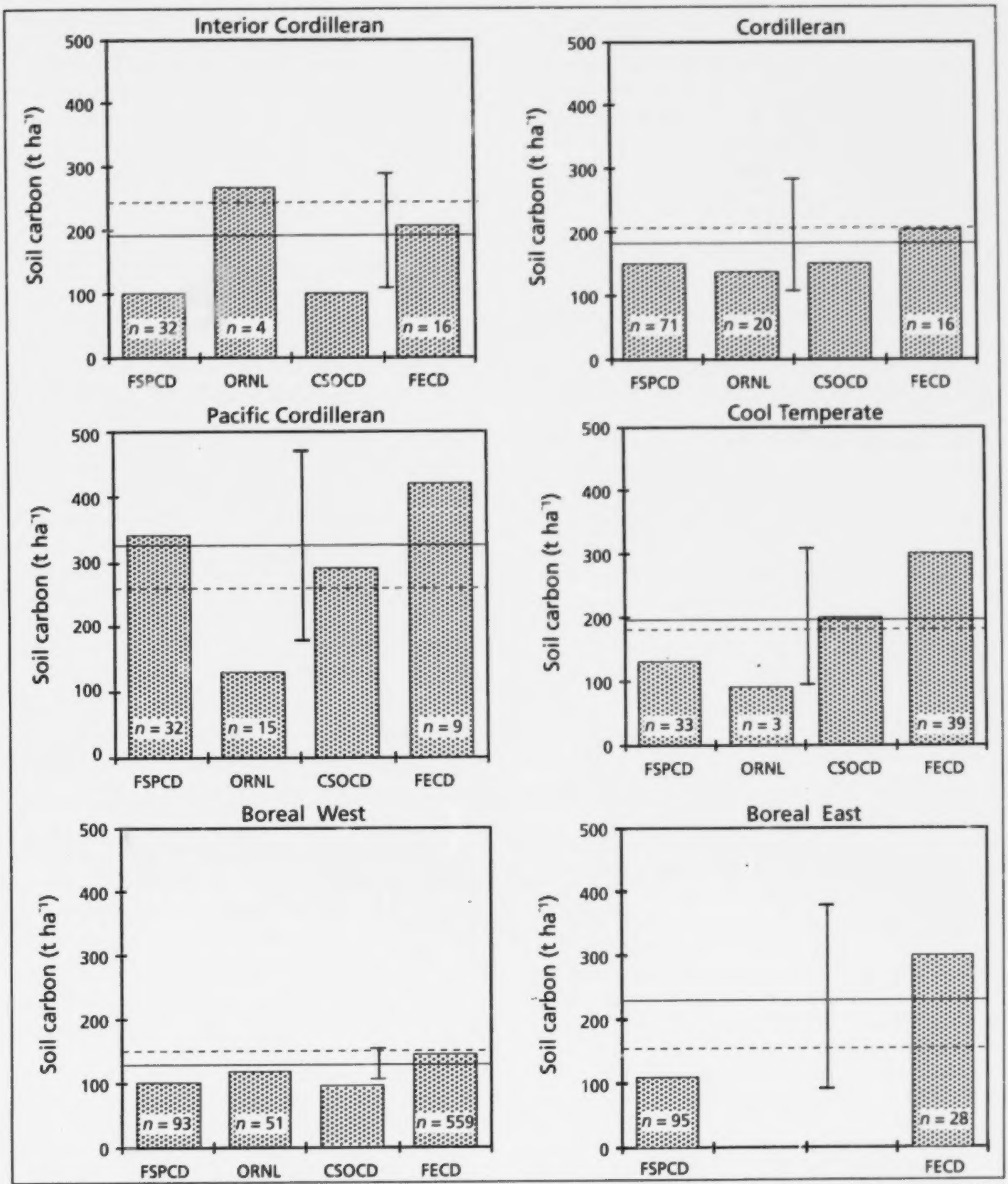


Figure 15. Comparison of four estimates for total soil carbon content (bars), their grand mean (solid line), and its standard deviation (error bar), with modeled results (dashed line) (Kurz and Apps 1999) for the various ecoclimatic provinces. *n* = number of plots used to estimate the mean represented by each bar; FSPCD = Forest Soil Profile Carbon Database (Siltanen et al. 1997), ORNL = Oak Ridge National Laboratory (as reported in Siltanen et al. 1997), CSOCD = Canadian Soil Organic Carbon Database (Tarnocai and Lacelle 1996), FECD = Forest Ecosystem Carbon Database. Note: no *n* values are given for CSOCD data because the estimate reported was based on map units and not individual plots.

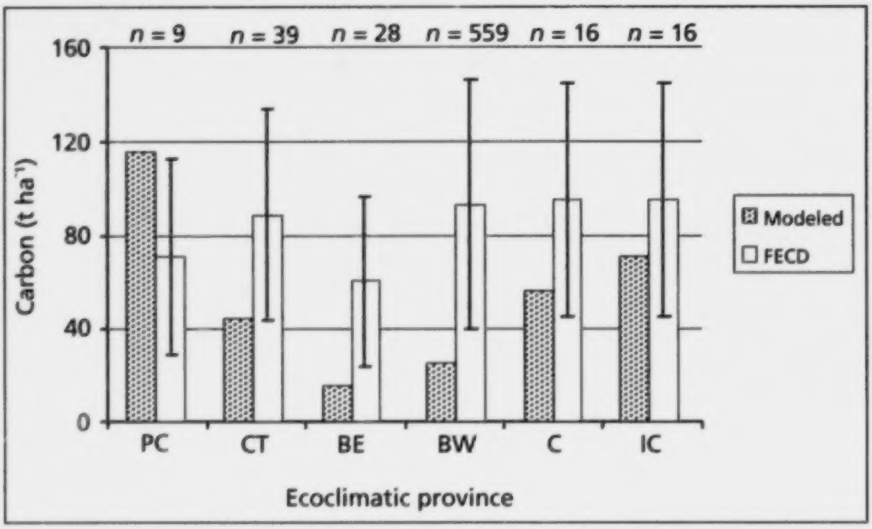


Figure 16. Comparison of estimates of average total live tree biomass carbon from the Forest Ecosystem Carbon Database (FECD) and the Carbon Budget Model of the Canadian Forest Sector 2 model (Kurz and Apps 1999). *n* = number of plots used to estimate the mean and standard deviation. PC = Pacific Cordilleran, CT = Cool Temperate, BE = Boreal East, BW = Boreal West, C = Cordilleran, and IC = Interior Cordilleran.

CONCLUDING REMARKS

This FECD is a compilation of data from over 700 plots from across Canada. Although it is, to the authors' knowledge, the largest database of its type in Canada, it represents only 30–40% of the total number of known similar plots in the country. The database is relatively complete for site description information, soil chemistry, stand-level estimates of live tree biomass (and carbon) components (foliage, stem wood, stem bark, branches) and their totals, as well as soil carbon content by horizon. Totals for organic and mineral soil horizons, total soil carbon, tree biomass carbon and total ecosystem carbon for each plot are provided in Appendix 3.

This compilation targeted data collected at single points in space (the plots) where aboveground (tree biomass) and belowground (forest floor, mineral soil) carbon were measured simultaneously. The data are best for site-specific analyses of the relationships between stand characteristics and edaphic factors that may influence the distribution of carbon between trees, the forest floor, and the mineral soil. Caution should be exercised when scaling up results from plots to larger ecosystem units (ecoregion or ecozone) because the plots are not sampled to be representative of the larger units. However, the FECD most likely represents the best publicly available compilation of this type of data currently available.

Estimates for detrital biomass (litter, fine and coarse woody debris, standing dead biomass, etc.) and carbon were available for some plots, but in general detrital components were not measured. No data were available for the natural disturbance or management histories of the stands where the plots were located. This represents a significant information gap, since disturbance and management history significantly influence stand age and therefore live tree biomass and transfers to detrital pools.

Many of the information gaps and the inability of the plots to accurately reflect large-scale ecosytem units should eventually be satisfied by data collected for the new National Forest

Inventory, but those data will not be available for model testing and analysis for some time. Thus, the FECD provides a quality-controled database to satisfy the immediate needs of large-scale ecosystem modelers and ecosystem analysts for model testing and meta-analyses.

Recognizing that the database and its template are of value to other forest research scientists, the Microsoft Access database and its template, as well as copies of Microsoft Excel spreadsheets for all of the Access tables, are provided on the accompanying compact disk.

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APPENDIX 1

VEGETATION SPECIES CODES AND CORRESPONDING SCIENTIFIC NAMES IN THE FOREST ECOSYSTEM CARBON DATABASE (FECD)

Appendix 1A. Trees[a]

FECD code	Scientific name
ABIE AMA	*Abies amabilis* (Dougl. ex Loud.) Dougl. ex Forbes
ABIE BAL	*Abies balsamea* (L.) Mill.
ABIE CON	*Abies concolor* (Gord. & Glend.) Lindl.
ABIE GRA	*Abies grandis* (Dougl. ex D. Don) Lindl.
ABIE LAS	*Abies lasiocarpa* (Hook.) Nutt.
ABIE MAG SHA	*Abies magnifica* A. Murr var. *shastensis* Lemmon
ABIE PRO	*Abies procera* Rehd.
ABIE SPP	*Abies* spp.
ACER CIR	*Acer circinatum* Pursh
ACER MAC	*Acer macrophyllum* Pursh
ACER NEG	*Acer negundo* L.
ACER PEN	*Acer pensylvanicum* L.
ACER PLA	*Acer platanoides* L.
ACER PSE	*Acer pseudoplatanus* L.
ACER RUB	*Acer rubrum* L.
ACER SAC	*Acer saccharinum* L.
ACER SAH	*Acer saccharum* Marsh.
ACER SPI	*Acer spicatum* Lamb.
ACER SPP	*Acer* spp.
ALNU CRI	*Alnus crispa* (Ait.) Pursh
ALNU TEN	*Alnus tenuifolia* Nutt.
ALNU INC RUG	*Alnus incana* (L.) Moench. ssp. *rugosa* (Du Roi) Clausen
ALNU INC TEN	*Alnus incana* (L.) Moench. ssp. *tenuifolia* (Nutt.) Breit
ALNU RUB	*Alnus rubra* Bong.
ALNU SIN	*Alnus sinuata* (Regel) Rydb.
ALNU SPP	*Alnus* spp.
AMEL SPP	*Amelanchier* spp.
ARBU MEN	*Arbutus menziesii* Pursh
ASIM TRI	*Asimina triloba* (L.) Dunal
BETU ALL	*Betula alleghaniensis* Britt.
BETU COR	*Betula cordifolia* Regel
BETU GLA	*Betula glandulosa* Michx.
BETU NEO	*Betula neoalaskana* Sarg.
BETU OCC	*Betula occidentalis* Hook.
BETU PAP	*Betula papyrifera* Marsh.
BETU PEN	*Betula pendula* Roth
BETU POP	*Betula populifolia* Marsh.
BETU PUB	*Betula pubescens* Ehrh.
BETU PUM	*Betula pumila* L.
BETU SPP	*Betula* spp.
BETU WIN	*Betula* x *winteri* Dugle
CALO DEC	*Calocedrus decurrens* (Torr.) Florin
CARP CAR	*Carpinus caroliniana* Walt.
CARY COR	*Carya cordiformis* (Wangenh.) K. Koch
CARY OVA	*Carya ovata* (Mill.) K. Koch
CAST DEN	*Castanea dentata* (Marsh.) Borkh.
CELT OCC	*Celtis occidentalis* L.
CHAM LAW	*Chamaecyparis lawsoniana* (A. Murr) Parl.
CHAM NOO	*Chamaecyparis nootkatensis* (D. Don) Spach
CORN ALT	*Cornus alternifolia* L. f.
CORN NUT	*Cornus nuttallii* Audub.
CORN STO	*Cornus stolonifera* Michx.
CORY COR	*Corylus cornuta* Marsh.
CRAT SPP	*Crataegus* spp.
FAGU GRA	*Fagus grandifolia* Ehrh.
FRAX AME	*Fraxinus americana* L.
FRAX LAT	*Fraxinus latifolia* Benth.
FRAX NIG	*Fraxinus nigra* Marsh.
FRAX PEN	*Fraxinus pennsylvanica* Marsh.
FRAX PEN SUB	*Fraxinus pennsylvanica* Marsh. var. *subintegerrima* (Vahl) Fern.
FRAX SPP	*Fraxinus* spp.
GENC	Unknown softwood
GENH	Unknown hardwood
GLED TRI	*Gleditsia triacanthos* L.
ILEX VER	*Ilex verticillata* (L.) A. Gray
JUGL CIN	*Juglans cinerea* L.
JUGL NIG	*Juglans nigra* L.
JUNI SCO	*Juniperus scopulorum* Sarg.
JUNI VIR	*Juniperus virginiana* L.
LARI DEC	*Larix decidua* Mill.
LARI KAE	*Larix kaempferi* (Lamb.) Carrière
LARI LAR	*Larix laricina* (Du Roi) K. Koch
LARI LYA	*Larix lyallii* Parl.
LARI OCC	*Larix occidentalis* Nutt.
LIRI TUL	*Liriodendron tulipifera* L.
MALU FUS	*Malus fusca* (Raf.) C.K. Schneid.
MALU SPP	*Malus* spp.
NEMO MUC	*Nemopanthus mucronatus* (L.) Trel.
NYSS SYL	*Nyssa sylvatica* Marsh.
OSTR VIR	*Ostrya virginiana* (Mill.) K. Koch
PICE ABI	*Picea abies* (L.) Karst.
PICE ENG	*Picea engelmannii* Parry ex Engelm.
PICE ENG GLA	*Picea engelmann* x *glauca*
PICE GLA	*Picea glauca* (Moench) Voss
PICE LUT X	*Picea* x *lutzii* Little
PICE MAR	*Picea mariana* (Mill.) BSP
PICE RUB	*Picea rubens* Sarg.
PICE SIT	*Picea sitchensis* (Bong.) Carrière
PICE SIT X	*Picea sitchensis* x ?
PICE SPP	*Picea* spp.
PINU ALB	*Pinus albicaulis* Engelm.
PINU BAN	*Pinus banksiana* Lamb.
PINU CON	*Pinus contorta* Dougl. ex Loud.
PINU CON CON	*Pinus contorta* Dougl. ex Loud.var. *contorta*
PINU CON LAT	*Pinus contorta* Dougl. ex Loud.var. *latifolia* Engelm.
PINU FLE	*Pinus flexilis* James
PINU LAM	*Pinus lambertiana* Dougl.
PINU MON	*Pinus monticola* Dougl. ex D. Don
PINU MUR	*Pinus* x *murray banksiana*
PINU NIG	*Pinus nigra* Arnold
PINU PON	*Pinus ponderosa* P. Laws. ex C. Laws.
PINU RAD	*Pinus radiata* D. Don
PINU RES	*Pinus resinosa* Ait.
PINU RIG	*Pinus rigida* Mill.
PINU SPP	*Pinus* spp.
PINU STR	*Pinus strobus* L.
PINU SYL	*Pinus sylvestris* L.
PLAT OCC	*Platanus occidentalis* L.
POPU ANG	*Populus angustifolia* James
POPU BAL	*Populus balsamifera* L.
POPU DEL	*Populus deltoides* Bartr. ex Marsh.

Appendix 1A. Concluded

FECD code	Scientific name
POPU DEL MON	*Populus deltoides* Bartr. ex Marsh ssp. *monilifera* (Ait.) Eckenw.
POPU GRA	*Populus grandidentata* Michx.
POPU SPP	*Populus* spp.
POPU TRE	*Populus tremuloides* Michx.
POPU TRI	*Populus trichocarpa* Torr. & A. Gray
PRUN AVI	*Prunus avium* (L.) L.
PRUN COM	*Prunus communis* Huds.
PRUN EMA	*Prunus emarginata* Dougl.
PRUN PEN	*Prunus pensylvanica* L. F.
PRUN SER	*Prunus serotina* Ehrh.
PRUN VIR	*Prunus virginiana* L.
PSEU MEN	*Pseudotsuga menziesii* (Mirb.) Franco
PSEU MEN GLA	*Pseudotsuga menziesii* (Mirb.) Franco var. *glauca* (Beissn.) Franco
PSEU MEN MEN	*Pseudotsuga menziesii* (Mirb.) Franco var. *menziesii*
QUER ALB	*Quercus alba* L.
QUER BIC	*Quercus bicolor* Willd.
QUER GAR	*Quercus garryana* Dougl.
QUER MAC	*Quercus macrocarpa* Michx.
QUER ROB	*Quercus robur* L.
QUER RUB	*Quercus rubra* L.
QUER SPP	*Quercus* spp.
QUER VEL	*Quercus velutina* Lam.
RHAM PUR	*Rhamnus purshiana* DC.
RHUS TYP	*Rhus typhina* L.
ROBI PSE	*Robinia pseudoacacia* L.
SALI AMY	*Salix amygdaloides* Andersson
SALI BEB	*Salix bebbiana* Sarg.
SALI DIS	*Salix discolor* Muhl.
SALI LUC LAS	*Salix lucida* ssp. *lasiandra* (Benth.) E. Murr
SALI LUC LUC	*Salix lucida* Muhl. ssp. *lucida*
SALI NIG	*Salix nigra* Marsh.
SALI PYR	*Salix pyrifolia* Andersson
SALI SCO	*Salix scouleriana* Barnett
SALI SIT	*Salix sitchensis* Sanson
SALI SPP	*Salix* spp.
SASS ALB	*Sassafras albidum* (Nutt.) Nees
SEQU GIG	*Sequoiadendron giganteum* (Lindl.) Buchh.
SEQU SEM	*Sequoia sempervirens* (D. Don) Endl.
SORB AME	*Sorbus americana* Marsh.
SORB AUC	*Sorbus aucuparia* L.
SORB DEC	*Sorbus decora* (Sarg.) C.K. Schneid.
SORB SCO	*Sorbus scopulina* Greene
SORB SPP	*Sorbus* spp.
TAXU BRE	*Taxus brevifolia* Nutt.
THUJ OCC	*Thuja occidentalis* L.
THUJ PLI	*Thuja plicata* Donn ex D. Don
TILI AME	*Tilia americana* L.
TSUG CAN	*Tsuga canadensis* (L.) Carrière
TSUG HET	*Tsuga heterophylla* (Raf.) Sarg.
TSUG MER	*Tsuga mertensiana* (Bong.) Carrière
TSUG MER HET	*Tsuga mertensiana* x *heterophylla*
ULMU AME	*Ulmus americana* L.
ULMU PUM	*Ulmus pumila* L.
ULMU RUB	*Ulmus rubra* Muhl.
ULMU THO	*Ulmus thomasii* Sarg.
VIBU SPP	*Viburnum* spp.

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[a] Provided by Tamara Brierley, National Forest Inventory, Canadian Forest Service, Victoria, BC.

Appendix 1B. Shrubs[a]

FECD code	Scientific name
ABIE BAL	*Abies balsamea* (L.) Mill.
ABIE BAS	*Abies balsamea* x *lasiocarpa*
ABIE LAS	*Abies lasiocarpa* (Hook.) Nutt.
ACER GLA	*Acer glabrum* Torr.
ACER SPI	*Acer spicatum* Lamb.
ALNU CRI	*Alnus crispa* (Ait.) Pursh
ALNU RUG	*Alnus rugosa* (Du Roi) Spreng.
ALNU TEN	*Alnus tenuifolia* Nutt.
AMAR ALB	*Amaranthus albus* L.
AMEL ALN	*Amelanchier alnifolia* (Nutt.) Nutt.
ANDR POL	*Andromeda polifolia* L.
ARCT RUB	*Arctostaphylos rubra* (Rehd. & Wilson) Fern.
ARCT SPP	*Arctostaphylos* spp.
ARCT UVA	*Arctostaphylos uva-ursi* (L.) Spreng.
ARTE CAN	*Artemisia cana* Pursh
ARTE TRI	*Artemesia tridentata* Nutt.
ATRI NUT	*Atriplex nuttallii* S. Wats.
BERB REP	*Berberis repens* Lindl.
BETU GLA	*Betula glandulosa* Michx.
BETU NEO	*Betula neoalaskana* Sarg.
BETU OCC	*Betula occidentalis* Hook.
BETU PAP	*Betula papyrifera* Marsh.
BETU PUM	*Betula pumila* L.
BETU SPP	*Betula* spp.
CASS MER	*Cassiope mertensiana* (Bong.) D. Don
CASS TET	*Cassiope tetragona* (L.) D. Don
CEAN VEL	*Ceanothus velutinus* Dougl. ex Hook.
CHAM CAL	*Chamaedaphne calyculata* (L.) Moench
CHIM UMB	*Chimaphila umbellata* (L.) W. Bart.
CLEM LIG	*Clematis ligusticifolia* Nutt.
CLEM OCC	*Clematis occidentalis* (Hornem.) DC.
CORN CAN	*Cornus canadensis* L.
CORN SPP	*Cornus* spp.
CORN STO	*Cornus stolonifera* Michx.
CORY COR	*Corylus cornuta* Marsh.
CRAT DOU	*Crataegus douglasii* Lindl.
CRAT ROT	*Crataegus rotundifolia* Moench p. p. non Lamb.
DIER LON	*Diervilla lonicera* P. Mill.
DRYA DRU	*Dryas* drummondii Richards. ex Hook.
DRYA INT	*Dryas integrifolia* Vahl
DRYA OCT	*Dryas octopetala* L.
DRYA SPP	*Dryas* spp.
ELAE COM	*Elaeagnus commutata* Bernh.
EMPE NIG	*Empetrum nigrum* L.
ERIO UMB	*Eriogonum umbellatum* Torr.
GAUL HIS	*Gaultheria hispidula* (L.) Muhl. ex Bigelow
GAUL HUM	*Gaultheria humifusa* (Graham) Rydb.
HUDS TOM	*Hudsonia tomentosa* Nutt.
JUNC CON	*Juncus confusus* Coville
JUNI COM	*Juniperus communis* L.
JUNI HOR	*Juniperus horizontalis* Moench
JUNI SCO	*Juniperus scopulorum* Sarg.
JUNI SPP	*Juniperus* spp.
KALM MIC	*Kalmia microphylla* (Hook.) Heller
KALM POL	*Kalmia polifolia* Wangenh.
LARI LAR	*Larix laricina* (Du Roi) K. Koch.
LARI LYA	*Larix lyallii* Parl.
LEDU GLA	*Ledum glandulosum* Nutt.
LEDU GRO	*Ledum groenlandicum* Oeder
LEDU PAL	*Ledum palustre* L.
LEDU SPP	*Ledum* spp.
LINN BOR	*Linnaea borealis* L.
LOIS PRO	*Loiseleuria procumbens* (L.) Desv.
LONI CAE	*Lonicera caerulea* L.
LONI DIO	*Lonicera dioica* L.
LONI INV	*Lonicera involucrata* (Richards.) Banks
LONI SPP	*Lonicera* spp.
LONI UTA	*Lonicera utahensis* S. Wats.
LUET PEC	*Luetkea pectinata* (Pursh) Kuntze
MENZ FER	*Menziesia ferruginea* Sm.
MYRI GAL	*Myrica gale* L.
OPLO HOR	*Oplopanax horridus* Miq.
OXYC MIC	*Oxycoccus microcarpus* Turcz.
OXYC QUA	*Oxycoccus quadripetalus* Gilib.
OXYC SPP	*Oxycoccus* spp.
PACH MYR	*Pachistima myrsinites* (Pursh) Raf.
PENS FRU	*Penstemon fruticosus* (Pursh) Greene
PHYL EMP	*Phyllodoce empetriformis* (Sm.) D. Don
PHYL GLA	*Phyllodoce glanduliflora* (Hook.) Coville
PHYL INT	*Phyllodoce* x *intermedia* (Hook.) Rydb.
PHYL SPP	*Phyllodoce* spp.
PICE ENG GLA	*Picea engelmannii* x *glauca*
PICE ENG	*Picea engelmannii* Parry ex Engelm.
PICE GLA	*Picea glauca* (Moench) Voss
PICE MAR	*Picea mariana* (Mill.) BSP
PINU ALB	*Pinus albicaulis* Engelm.
PINU BAN	*Pinus banksiana* Lamb.
PINU COB	*Pinus contorta* x *banksiana*
PINU CON	*Pinus contorta* Dougl. ex Loud.
PINU FLE	*Pinus flexilis* James
POPU BAL	*Populus balsamifera* L.
POPU TRE	*Populus tremuloides* Michx.
POTE FRU	*Potentilla fruticosa* L.
PRUN PEN	*Prunus pensylvanica* L. f.
PRUN VIR	*Prunus virginiana* L.
PSEU MEN	*Pseudotsuga menziesii* (Mirb.) Franco
RHAM ALN	*Rhamnus alnifolia* L'Hér.
RHOD ALB	*Rhododendron albiflorum* Hook.
RHOD LAP	*Rhododendron lapponicum* (L.) Wahl.
RHUS RAD	*Rhus radicans* L.
RIBE AME	*Ribes americanum* P. Mill.
RIBE GLA	*Ribes glandulosum* Grauer
RIBE HIR	*Ribes hirtellum* Michx.
RIBE HUD	*Ribes hudsonianum* Richards.
RIBE INE	*Ribes inerme* Rydb.
RIBE LAC	*Ribes lacustre* (Pers.) Poir.
RIBE LAX	*Ribes laxiflorum* Pursh
RIBE OXY	*Ribes oxyacanthoides* L.
RIBE SPP	*Ribes* spp.
RIBE TRI	*Ribes triste* Pall.
RIBE VIS	*Ribes viscosissimum* Pursh
ROSA ACI	*Rosa acicularis* Lindl.
ROSA ARK	*Rosa arkansana* Porter
ROSA SPP	*Rosa* spp.
ROSA WOO	*Rosa woodsii* Lindl.
RUBU ARC	*Rubus arcticus* L.
RUBU CHA	*Rubus chamaemorus* L.
RUBU IDA	*Rubus idaeus* L.

Appendix 1B. Concluded

FECD code	Scientific name
RUBU PAA	*Rubus* x *paracaulis* Bailey
RUBU PAR	*Rubus parviflorus* Nutt.
RUBU PUB	*Rubus pubescens* Raf.
RUBU SPP	*Rubus* spp.
SALI ALA	*Salix alaxensis* (Andersson) Coville
SALI AMY	*Salix amygdaloides* Andersson
SALI ARB	*Salix arbusculoides* Andersson
SALI ARC	*Salix arctica* Pallas
SALI ATH	*Salix athabascensis* Raup
SALI BAA	*Salix barrattiana* Hook.
SALI BAR	*Salix barclayi* Andersson
SALI BEB	*Salix bebbiana* Sarg.
SALI BOO	*Salix boothii* Dorn
SALI BRA	*Salix brachycarpa* Nutt.
SALI CAN	*Salix candida* Flueggé ex Willd.
SALI COM	*Salix commutata* Bebb
SALI DIS	*Salix discolor* Muhl.
SALI DRU	*Salix drummondiana* Barratt ex Hook.
SALI EXI	*Salix exigua* Nutt.
SALI FAR	*Salix farriae* Ball
SALI GLA	*Salix glauca* L.
SALI LAN	*Salix lanata* L.
SALI LUC	*Salix lucida* Muhl.
SALI LUT	*Salix lutea* Nutt.
SALI MAC	*Salix maccalliana* Rowlee
SALI MEL	*Salix melanopsis* Nutt.
SALI MYR	*Salix myrtillifolia* Andersson
SALI PED	*Salix pedicellaris* Pursh
SALI PET	*Salix petiolaris* Sm.
SALI PLA	*Salix planifolia* Pursh
SALI PRO	*Salix prolixa* Andersson
SALI PSE	*Salix pseudomonticola* Ball
SALI PYR	*Salix pyrifolia* Andersson
SALI RET	*Salix reticulata* L.
SALI SCO	*Salix scouleriana* Barratt
SALI SER	*Salix serissima* (Bailey) Fern.
SALI SIT	*Salix sitchensis* Sanson
SALI SPP	*Salix* spp.
SALI STO	*Salix stolonifera* Coville
SALI VES	*Salix vestita* Pursh
SAMB RAC	*Sambucus racemosa* L.
SAMB SPP	*Sambucus* spp.
SARC VER	*Sarcobatus vermiculatus* (Hook.) Torr.
SHEP ARG	*Shepherdia argentea* Nutt.
SHEP CAN	*Shepherdia canadensis* (L.) Nutt.
SIBB PRO	*Sibbaldia procumbens* L.
SORB SCO	*Sorbus scopulina* Greene
SORB SIT	*Sorbus sitchensis* M.J. Roem.
SORB SPP	*Sorbus* spp.
SPHA COC	*Sphaeralcea coccinea* (Nutt.) Rydb.
SPIR ALB	*Spiraea alba* Du Roi
SPIR BET	*Spiraea betulifolia* Pallas
SPIR DEN	*Spiraea densiflora* Nutt. ex T. & G.
SYMP ALB	*Symphoricarpos albus* (L.) Blake
SYMP OCC	*Symphoricarpos occidentalis* Hook.
THUJ OCC	*Thuja occidentalis* L.
VACC ANG	*Vaccinium angustifolium* Ait.
VACC CAE	*Vaccinium caespitosum* Michx.
VACC MEM	*Vaccinium membranaceum* Dougl. ex Hook.
VACC MYR	*Vaccinium myrtilloides* Michx.
VACC MYT	*Vaccinium myrtillus* L.
VACC OVA	*Vaccinium ovalifolium* J.E. Smith
VACC SCO	*Vaccinium scoparium* Leib. ex Coville
VACC SPP	*Vaccinium* spp.
VACC ULI	*Vaccinium uliginosum* L.
VACC VIT	*Vaccinium vitis-idaea* L.
VIBU EDU	*Viburnum edule* (Michx.) Raf.
VIBU OPU	*Viburnum opulus* L.

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[a] Based on the Alberta plants and fungi — Master species list and species group checklists provided by the Resource Data Branch, Alberta Sustainable Resource Development, Government of Alberta.

Appendix 1C. Herb species[a]

FECD code	Scientific name
ABRO MIC	*Abronia micrantha* Torr.
ABUT THE	*Abutilon theophrasti* Medik.
ACHI MIL	*Achillea millefolium* L.
ACHI PTA	*Achillea ptarmica* L.
ACHI SIB	*Achillea sibirica* Ledeb.
ACHI SPP	*Achillea* spp.
ACON DEL	*Aconitum delphiinifolium* DC.
ACOR AME	*Acorus americanus* (Raf.) Raf.
ACTA RUB	*Actaea rubra* (Ait.) Willd.
ADEN BIC	*Adenocaulon bicolor* Hook.
ADIA PED	*Adiantum pedatum* L.
ADOX MOS	*Adoxa moschatellina* L.
AGAS FOE	*Agastache foeniculum* (Pursh) Kuntze
AGOS AUR	*Agoseris aurantiaca* (Hook.) Greene
AGOS GLA	*Agoseris glauca* (Pursh) Raf.
AGOS SPP	*Agoseris* spp.
AGRI STR	*Agrimonia striata* Scribn. & Smith
AGRO ALB	*Agropyron albicans* (Scribn. & J.G. Sm.) A. Löve
AGRO BOW	Agroelymus bowdenii
AGRO DAS	*Agropyron dasystachyum* (Hook.) Scribn. & J.G. Sm.
AGRO EXA	*Agrostis exarata* Trin.
AGRO HIR	*Agroelymus hirtiflorus* (A.S. Hitchc.) Barkworth
AGRO HUM	*Agrostis humilis* Vasey
AGRO MAC	*Agrohordeum macounii Vasey*
AGRO MER	*Agrostis mertensii* Trin.
AGRO MOS	*Agroelymus mossii* Lepage
AGRO PEC	*Agropyron pectiniforme* Roemer & J.A. Schultes
AGRO REP	*Agropyron repens* (L.) Beaverd
AGRO SCA	*Agrostis scabra* Willd.
AGRO SCR	*Agropyron scribneri* Vasey
AGRO SIB	*Agropyron sibiricum* (Willd.) Beaverd
AGRO SMI	*Agropyron smithii* Rydb.
AGRO SPI	*Agropyron spicatum* (Pursh) Scribn. & Smith
AGRO SPP	*Agropyron* spp.
AGRO STO	*Agrostis stolonifera* L.
AGRO THU	*Agrostis thurberiana* A.S. Hichc.
AGRO TRA	*Agropyron trachycaulum* (Link) Malte ex H.F. Lewis
AGRO TUR	Agroelymus turneri
AGRO VAR	*Agrostis variabilis* Rydb.
AGRO VIO	*Agropyron violaceum* (Hornem.) Lange
ALIS GRA	*Alisma gramineum* Lej.
ALIS PLA	*Alisma plantago-aquatica* L.
ALLI CER	*Allium cernuum* Roth
ALLI GEY	*Allium geyeri* S. Wats.
ALLI SCH	*Allium schoenoprasum* L.
ALLI TEX	*Allium textile* Nels. & Macbr.
ALOP AEQ	*Alopecurus aequalis* Sobol.
ALOP OCC	*Alopecurus occidentalis* Scribn. & Tweedy
ALOP PRA	*Alopecurus pratensis* L.
ALYS ALY	*Alyssum alyssoides* (L.) L.
ALYS DES	*Alyssum desertorum* Stapf
ALYS MUR	*Alyssum murale* Waldst. & Kit.
AMAR CAL	*Amaranthus californicus* (Moq.) S. Wats.
AMAR GRA	*Amaranthus graecizans* auct. non L.
AMAR POW	*Amaranthus powellii* S. Wats.
AMAR RET	*Amaranthus retroflexus* L.
AMBR ART	*Ambrosia artemisiifolia* L.
AMBR PSI	*Ambrosia psilostachya* DC.
AMBR TRI	*Ambrosia trifida* L.
AMSI MEN	*Amsinckia menziesii* (Lehm.) A. Nels. & J.F. Macbr.
ANAP MAR	*Anaphalis margaritacea* (L.) Benth. & Hook. f. ex C.B. Clarke
ANDR CHA	*Androsace chamaejasme* Wulfen
ANDR OCC	*Androsace occidentalis* Pursh
ANDR SEP	*Androsace septentrionalis* L.
ANDR SPP	*Androsace* spp.
ANEM CAN	*Anemone canadensis* L.
ANEM CYL	*Anemone cylindrica* Gray
ANEM LIT	*Anemone lithophila* Rydb.
ANEM MUL	*Anemone multifida* Poir.
ANEM OCC	*Anemone occidentalis* (S. Wats.) Freyn
ANEM PAR	*Anemone parviflora* Michx.
ANEM PAT	*Anemone patens* L.
ANEM QUI	*Anemone quinquefolia* L.
ANEM RIC	*Anemone richardsonii* Hook.
ANEM RIP	*Anemone riparia* Fern.
ANEM SPP	*Anemone* spp.
ANET GRA	*Anethum graveolens* L.
ANGE ARG	*Angelica arguta* Nutt.
ANGE DAW	*Angelica dawsonii* S. Wats.
ANGE GEN	*Angelica genuflexa* Nutt.
ANGE SPP	*Angelica* spp.
ANTE ALP	*Antennaria alpina* (L.) Gaertn.
ANTE ANA	*Antennaria anaphaloides* Rydb.
ANTE APR	*Antennaria aprica* Greene
ANTE COR	*Antennaria corymbosa* E. Nels.
ANTE DIM	*Antennaria dimorpha* (Nutt.) Torr. & Gray
ANTE LAN	*Antennaria lanata* (Hook.) Greene
ANTE LUZ	*Antennaria luzuloides* Torr. & Gray
ANTE MON	*Antennaria monocephala* D.C. Eaton
ANTE NEG	*Antennaria neglecta* Greene
ANTE PAR	*Antennaria parvifolia* Nutt.
ANTE PUL	*Antennaria pulcherrima* (Hook.) Greene
ANTE RAC	*Antennaria racemosa* Hook.
ANTE ROS	*Antennaria rosea* Greene
ANTE SPP	*Antennaria* spp.
ANTE UMB	*Antennaria umbrinella* Rydb.
ANTH COT	*Anthemis cotula* L.
ANTH TIN	*Anthemis tinctoria* L.
APOC AND	*Apocynum androsaemifolium* L.
APOC CAN	*Apocynum cannabinum* L.
APOC MED	*Apocynum* x *medium* Greene
AQUI BRE	*Aquilegia brevistyla* Hook.
AQUI FLA	*Aquilegia flavescens* S. Wats.
AQUI FOR	*Aquilegia formosa* Fisch. ex DC.
AQUI JON	*Aquilegia jonesii* Parry
AQUI SPP	*Aquilegia* spp.
ARAB DIV	*Arabis divaricarpa* A. Nels.
ARAB DRU	*Arabis drummondii* Gray
ARAB GLA	*Arabis glabra* (L.) Bernh.
ARAB HIR	*Arabis hirsuta* (L.) Scop.
ARAB HOL	*Arabis holboellii* Hornem.
ARAB LEM	*Arabis lemmonii* S. Wats.

Appendix 1C. Continued

FECD code	Scientific name
ARAB LYA	*Arabis lyallii* S. Wats.
ARAB LYR	*Arabis lyrata* L.
ARAB NUT	*Arabis nuttallii* B.L. Robins.
ARAB SPP	*Arabis* spp.
ARAL NUD	*Aralia nudicaulis* L.
ARCE AME	*Arceuthobium americanum* Nutt. ex Engelm.
ARCT ARU	*Arctagrostis arundinacea* (Trin.) Beal
ARCT LAP	*Arctium lappa* L.
ARCT MIN	*Arctium minus* Bernh.
ARCT TOM	*Arctium tomentosum* P. Mill.
ARCT UVA	*Arctostaphylos uva-ursi* (L.) Spreng
AREN CAP	*Arenaria capillaris* Poir.
AREN CON	*Arenaria congesta* Nutt.
AREN LON	*Arenaria longipedunculata* Hultén
AREN SER	*Arenaria serpyllifolia* L.
AREN SPP	*Arenaria* spp.
ARIS LON	*Aristida longiseta* Steud.
ARMO RUS	*Armoracia rusticana* P.G. Gaertn., B. Mey. & Scherb.
ARNI AMP	*Arnica amplexicaulis* Nutt.
ARNI ANG	*Arnica angustifolia* Vahl
ARNI CHA	*Arnica chamissonis* Less.
ARNI COR	*Arnica cordifolia* Hook.
ARNI DIV	*Arnica diversifolia* Greene
ARNI FUL	*Arnica fulgens* Pursh
ARNI GRA	*Arnica gracilis* Rydb.
ARNI LAT	*Arnica latifolia* Bong.
ARNI LOC	*Arnica lonchophylla* Greene
ARNI LON	*Arnica longifolia* D.C. Eaton
ARNI LOU	*Arnica louiseana* Farr.
ARNI MOL	*Arnica mollis* Hook.
ARNI PAR	*Arnica parryi* Gray
ARNI RYD	*Arnica rydbergii* Greene
ARNI SOR	*Arnica sororia* Greene
ARNI SPP	*Arnica* spp.
ARTE ABR	*Artemisia abrotanum* L.
ARTE ABS	*Artemisia absinthium* L.
ARTE BIE	*Artemisia biennis* Willd.
ARTE BOR	Artemisia borealis
ARTE CAM	*Artemisia campestris* L.
ARTE DRA	*Artemisia dracunculus* L.
ARTE FRI	*Artemisia frigida* Willd.
ARTE FUR	*Artemisia furcata* Bieb.
ARTE LON	*Artemisia longifolia* Nutt.
ARTE LUD	*Artemisia ludoviciana* Nutt.
ARTE MIC	*Artemisia michauxiana* Bess.
ARTE NOR	*Artemisia norvegica* Fries
ARTE SPP	*Artemesia* spp.
ARTE TIL	*Artemisia tilesii* Ledeb.
ARUN SYL	*Aruncus sylvester* Kostel.
ASCL OVA	*Asclepias ovalifolia* Dcne.
ASCL SPE	*Asclepias speciosa* Torr.
ASCL VIR	*Asclepias viridiflora* Raf.
ASPA OFF	*Asparagus officinalis* L.
ASPE ARV	*Asperula arvensis* L.
ASPE PRO	*Asperugo procumbens* L.
ASPL VIR	*Asplenium viride* Huds.
ASTE ALP	*Aster alpinus* L.
ASTE ASC	*Aster ascendens* Lindl.
ASTE BOR	*Aster borealis* (Torr. & Gray) Prov.

FECD code	Scientific name
ASTE BRA	*Aster brachyactis* Blake
ASTE CAM	*Aster campestris* Nutt.
ASTE CIL	*Aster ciliolatus* Lindl.
ASTE CON	*Aster conspicuus* Lindl.
ASTE EAT	*Aster eatonii* (Gray) T.J. Howell
ASTE ENG	*Aster engelmannii* (D.C. Eaton) Gray
ASTE ERI	*Aster ericoides* L.
ASTE FAL	*Aster falcatus* Lindl.
ASTE HES	*Aster hesperius* Gray
ASTE LAE	*Aster laevis* L.
ASTE MAC	*Aster maccallae* Rydb.
ASTE MOD	*Aster modestus* Lindl.
ASTE PAU	*Aster pauciflorus* Nutt.
ASTE PUN	*Aster puniceus* L.
ASTE SIB	*Aster sibiricus* L.
ASTE SPP	*Aster* spp.
ASTE SUB	*Aster subspicatus* Nees
ASTE UMB	*Aster umbellatus* P. Mill.
ASTR ABO	*Astragalus aboriginum* Richards
ASTR ALP	*Astragalus alpinus* L.
ASTR AME	*Astragalus americanus* (Hook.) M.E. Jones
ASTR BIS	*Astragalus bisulcatus* (Hook.) Gray
ASTR BOD	*Astragalus bodinii* Sheldon
ASTR BOU	*Astragalus bourgovii* Gray
ASTR CAN	*Astragalus canadensis* L.
ASTR CIC	*Astragalus cicer* L.
ASTR CRA	*Astragalus crassicarpus* Nutt.
ASTR DAS	*Astragalus dasyglottis* Fisch. ex DC.
ASTR DRU	*Astragalus drummondii* Dougl. ex Hook.
ASTR EUC	*Astragalus eucosmus* B.L. Robins.
ASTR FLE	*Astragalus flexuosus* (Hook.) Dougl. ex G. Don
ASTR GIL	*Astragalus gilviflorus* Sheldon
ASTR KEN	*Astragalus kentrophyta* Gray
ASTR LOT	*Astragalus lotiflorus* Hook.
ASTR MIO	*Astragalus missouriensis* Nutt.
ASTR MIS	*Astragalus miser* Dougl.
ASTR PEC	*Astragalus pectinatus* (Hook.) Dougl. ex G. Don
ASTR PUR	*Astragalus purshii* Dougl. ex Hook.
ASTR ROB	*Astragalus robbinsii* (Oakes) Gray
ASTR SPA	*Astragalus spatulatus* Sheldon
ASTR SPP	*Astragalus* spp.
ASTR STR	*Astragalus striatus* Nutt.
ASTR TEN	*Astragalus tenellus* Pursh
ASTR VEX	*Astragalus vexilliflexus* Sheldon
ATHY DIS	*Athyrium distentifolium* Tausch ex Opiz.
ATHY FIL	*Athyrium filix-femina* (L.) Roth
ATRI ARG	*Atriplex argentea* Nutt.
ATRI HET	*Atriplex heterosperma* Burge
ATRI HOR	*Atriplex hortensis* L.
ATRI OBL	*Atriplex oblongifolia* Waldst. & Kit.
ATRI POW	*Atriplex powellii* S. Wats.
ATRI PRO	*Atriplex prostrata* Bouchér ex DC.
ATRI ROS	*Atriplex rosea* L.
ATRI SUB	*Atriplex subspicata* (Nutt.) Rydb.
ATRI SUC	*Atriplex suckleyi* (Torr.) Rydb.

Appendix 1C. Continued

FECD code	Scientific name
ATRI TRU	*Atriplex truncata* (Torr. ex S. Wats.) Gray
AVEN FAT	*Avena fatua* L.
AVEN SAT	*Avena sativa* L.
AXYR AMA	*Axyris amaranthoides* L.
BAHI OPP	*Bahia oppositifolia* (Nutt.) Rydb. ex Britt.
BALS SAG	*Balsamorhiza sagittata* (Pursh) Nutt.
BARB ORT	*Barbarea orthoceras* Ledeb.
BARB VUL	*Barbarea vulgaris* Ait. f.
BASS HYS	*Bassia hyssopifolia* (Pallas) Kuntz
BECK SYZ	*Beckmannia syzigachne* (Steud.) Fern.
BERT INC	*Berteroa incana* (L.) DC.
BESS WYO	*Besseya wyomingensis* (A. Nels.) Rydb.
BIDE CER	*Bidens cernua* L.
BIDE FRO	*Bidens frondosa* L.
BIDE TRI	*Bidens tripartita* L.
BOIS GLA	*Boisduvalia glabella* (Nutt.) Walp.
BORA OFF	*Borago officinalis* L.
BOSC ROS	*Boschniakia rossica* (Cham. & Schlecht.) Fedtsch.
BOTR ASC	*Botrychium ascendens* W.H. Wagner
BOTR BOR	*Botrychium boreale* (Fries) Milde
BOTR DUS	*Botrychium dusenii* auct. non (Christ) Alston
BOTR LAN	*Botrychium lanceolatum* (Gmel.) Angstr.
BOTR LUN	*Botrychium lunaria* (L.) Sw.
BOTR MUL	*Botrychium multifidum* (Gmel.) Trev.
BOTR PAR	*Botrychium paradoxum* W.H. Wagner
BOTR SIM	*Botrychium simplex* E. Hitchc.
BOTR SPP	*Botrychium* spp.
BOTR VIR	*Botrychium virginianum* (L.) Sw.
BOUT GRA	*Bouteloua gracilis* (Willd. ex Kunth) Lag. ex Griffiths
BRAS KAB	*Brassica kaber* (DC.) L.C. Wheeler
BRAS CAM	*Brassica campestris* L.
BRAS HIR	*Brassica hirta* Moench
BRAS JUN	*Brassica juncea* (L.) Czern.
BRAS NAP	*Brassica napus* L.
BRAY HUM	*Braya humilis* (C.A. Mey.) B.L. Robins.
BRAY PUR	*Braya purpurascens* (R. Br.) Burge
BRAY SPP	*Braya* spp.
BRIC GRA	*Brickellia grandiflora* (Hook.) Nutt.
BROM ALT	*Bromus altissimus* Pursh
BROM ANO	*Bromus anomalus* Rupr. ex Fourn.
BROM CAR	*Bromus carinatus* Hook. & Arn.
BROM CIL	*Bromus ciliatus* L.
BROM COM	*Bromus commutatus* Schrad.
BROM INE	*Bromus inermis* Leyss.
BROM JAP	*Bromus japonicus* Thunb. ex Mrr.
BROM MOL	*Bromus mollis* L.
BROM PUM	*Bromus inermis* Leyss. ssp. *Pumpellianus (Scribn.)*
BROM SEC	*Bromus secalinus* L.
BROM SPP	*Bromus* spp.
BROM SQU	*Bromus squarrosus* L.
BROM TEC	*Bromus tectorum* L.
BROM VUL	*Bromus vulgaris* (Hook.) Shear
BUPL AME	*Bupleurum americanum* Coult. & Rose
CALA CAN	*Calamagrostis canadensis* (Michx.) Beauverd
CALA INE	*Calamagrostis inexpansa* Gray
CALA LAP	*Calamagrostis lapponica* (Wahlenb.) Hartman
CALA LON	*Calamovilfa longifolia* (Hook.) Scribn.
CALA MON	*Calamagrostis montanensis* Scribn. ex Vasey
CALA PUR	*Calamagrostis purpurascens* R. Br.
CALA RUB	*Calamagrostis rubescens* Buckl.
CALA SPP	*Calamagrostis* spp.
CALA STR	*Calamagrostis stricta* (Timm) Koel.
CALL HER	*Callitriche hermaphroditica* L.
CALL PAL	*Calla palustris* L.
CALL VER	*Callitriche verna* L.
CALO API	*Calochortus apiculatus* Baker
CALT LEP	*Caltha leptosepala* DC.
CALT NAT	*Caltha natans* Pallas ex Georgi
CALT PAL	*Caltha palustris* L.
CALT SPP	*Caltha* spp.
CALY BUL	*Calypso bulbosa* (L.) Oakes
CAMA QUA	*Camassia quamash* (Pursh) Greene
CAME MIC	*Camelina microcarpa* DC.
CAME PAR	*Camelina parodii* Ibarra & La Porte
CAME SAT	*Camelina sativa* (L.) Crantz
CAMP LAS	*Campanula lasiocarpa* Cham.
CAMP RAP	*Campanula rapunculoides* L.
CAMP ROT	*Campanula rotundifolia* L.
CAMP UNI	*Campanula uniflora* L.
CANN SAT	*Cannabis sativa* L.
CAPS BUR	*Capsella bursa-pastoris* (L.) Medik.
CARD BEL	*Cardamine bellidifolia* L.
CARD CHA	*Cardaria chalepensis* L.
CARD DRA	*Cardaria draba* (L.) Desv.
CARD NUT	*Carduus nutans* L.
CARD PAR	*Cardamine parviflora* L.
CARD PEN	*Cardamine pensylvanica* Muhl. ex Willd.
CARD PRA	*Cardamine pratensis* L.
CARD PUB	*Cardaria pubescens* (C.A. Mey.) Jarmolenko
CARD SPP	*Cardamine* spp.
CARD UMB	*Cardamine umbellata* Greene
CARE ADU	*Carex adusta* Boott
CARE AEN	*Carex aenea* Fern.
CARE ALB	*Carex albo-nigra* Mack.
CARE APE	*Carex aperta* Boott
CARE AQU	*Carex aquatilis* Wahlenb.
CARE ARC	*Carex arcta* Boott
CARE ATH	*Carex atherodes* Spreng.
CARE ATR	*Carex athrostachya* Olney
CARE ATS	*Carex atrosquama* Mackenzie
CARE AUR	*Carex aurea* Nutt.
CARE BAC	*Carex backii* Boott
CARE BEB	*Carex bebbii* Olney ex Fern.
CARE BIP	*Carex bipartita* All.
CARE BRE	*Carex brevior* (Dewey) Mackenzie
CARE BRU	*Carex brunnescens* (Pers.) Poir.
CARE BUX	*Carex buxbaumii* Wahlenb.
CARE CAI	*Carex capitata* L.
CARE CAP	*Carex capillaris* L.
CARE CHO	*Carex chordorrhiza* Ehrh. ex L. f.
CARE COC	*Carex concinnoides* Mackenzie
CARE CON	*Carex concinna* R. Br.

Appendix 1C. Continued

FECD code	Scientific name
CARE CRA	*Carex crawei* Dewey
CARE CRW	*Carex crawfordii* Fern.
CARE CUR	*Carex curta* Goodenough
CARE DEF	*Carex deflexa* Hornem.
CARE DEW	*Carex deweyana* Schwein.
CARE DIA	*Carex diandra* Schrank
CARE DIS	*Carex disperma* Dewey
CARE DOU	*Carex douglasii* Boott
CARE EBU	*Carex eburnea* Boott
CARE ENA	*Carex enanderi* Holm
CARE EPA	*Carex epapillosa* Mackenzie
CARE FIL	*Carex filifolia* Nutt.
CARE FLA	*Carex flava* L.
CARE FRA	*Carex franklinii* Boott
CARE GEY	*Carex geyeri* Boott
CARE GLA	*Carex glacialis* Mackenzie
CARE GYN	*Carex gynocrates*Wormsk. ex Drej
CARE HAY	*Carex haydeniana* Olney
CARE HEL	*Carex heleonastes* L. f.
CARE HOD	*Carex hoodii* Boott
CARE HOO	*Carex hookerana* Dewey
CARE HOU	*Carex houghtoniana* Torr. ex Dewey
CARE HYS	*Carex hystricina* Muhl. ex Willd.
CARE ILL	*Carex illota* Bailey
CARE INT	*Carex interior* Bailey
CARE KEL	*Carex kelloggii* W. Boott
CARE LAC	*Carex lacustris* Willd.
CARE LAN	*Carex lanuginosa* Michx.
CARE LAS	*Carex lasiocarpa* Ehrh.
CARE LEN	*Carex lenticularis* Michx.
CARE LEP	*Carex leptalea* Wahlenb.
CARE LIM	*Carex limosa* L.
CARE LIV	*Carex livida* (Wahlenb.) Willd.
CARE LOL	*Carex loliacea* L.
CARE MAC	*Carex macloviana* d'Urv.
CARE MAR	*Carex maritima* Gunn.
CARE MER	*Carex mertensii* Prescott ex Bong.
CARE MIC	*Carex microglochin* Wahlenb.
CARE MIR	*Carex microptera* Mackenzie
CARE MIS	*Carex misandra* R. Br.
CARE NAR	*Carex nardina* Fries
CARE NEB	*Carex nebraskensis* Dewey
CARE NIG	*Carex nigricans* C.A. Mey.
CARE NOR	*Carex norvegica* Retz.
CARE OBT	*Carex obtusata* Lilj.
CARE OLI	*Carex oligosperma* Michx.
CARE PAC	*Carex pachystachya* Cham. ex Steud.
CARE PAP	*Carex paupercula* Michx.
CARE PAR	*Carex parryana* Dewey
CARE PAU	*Carex pauciflora* Lightf.
CARE PAY	*Carex paysonis* Clokey
CARE PEC	*Carex peckii* Howe
CARE PEN	*Carex pensylvanica* Lam.
CARE PER	*Carex petricosa* Dewey
CARE PET	*Carex petasata* Dewey
CARE PHA	*Carex phaeocephala* Piper
CARE PLA	*Carex platylepis* Mackenzie
CARE POD	*Carex podocarpa* R. Br.
CARE PRA	*Carex prairea* Dewey ex Wood
CARE PRE	*Carex presli* Steud.
CARE PRG	*Carex praegracilis* W. Boott
CARE PRT	*Carex praticola* Rydb.
CARE PSE	*Carex pseudocyperus* L.
CARE PYR	*Carex pyrenaica* Wahlenb.
CARE RAN	*Carex raynoldsii* Dewey
CARE RAY	*Carex raymondii* Calder
CARE RET	*Carex retrorsa* Schwein.
CARE RIC	*Carex richardsonii* R. Br.
CARE ROI	*Carex* rossii Boott
CARE ROS	*Carex rostrata* Stokes
CARE RUP	*Carex rupestris* All.
CARE SAR	*Carex sartwellii* Dewey
CARE SAX	*Carex saxatilis* L.
CARE SCI	*Carex scirpoidea* Michx.
CARE SCO	*Carex scoparia* Schkuhr ex Willd.
CARE SCP	*Carex scopulorum* Holm
CARE SIC	*Carex siccata* Dewey
CARE SIM	*Carex simulata* Mackenzie
CARE SPE	*Carex spectabilis* Dewey
CARE SPP	*Carex* spp.
CARE SPR	*Carex sprengelii* Dewey ex Spreng.
CARE STE	*Carex stenophylla* Wahlenb.
CARE STI	*Carex stipata* Muhl. ex Willd.
CARE SYC	*Carex sychnocephala* Carey
CARE TEN	*Carex tenera* Dewey
CARE TEU	*Carex tenuiflora* Wahlenb.
CARE TIN	*Carex tincta* (Fern.) Fern.
CARE TOR	*Carex torreyi* Tuckerman
CARE TRI	*Carex trisperma* Dewey
CARE UMB	*Carex umbellata* Schkuhr ex Willd.
CARE UTR	*Carex utriculata* Boott
CARE VAG	*Carex vaginata* Tausch
CARE VES	*Carex vesicaria* L.
CARE VIR	*Carex viridula* Michx.
CARE VUL	*Carex vulpinoidea* Michx.
CARE XER	*Carex xerantica* Bailey
CART TIN	*Carthamus tinctorius* L.
CARU CAR	*Carum carvi* L.
CAST CUS	*Castilleja cusickii* Greenm.
CAST HIS	*Castilleja hispida* Benth.
CAST LUT	*Castilleja lutescens* (Greenm.) Rydb.
CAST MIN	*Castilleja miniata* Dougl. ex Hook.
CAST OCC	*Castilleja occidentalis* Torr.
CAST RAU	*Castilleja raupii* Pennell
CAST RHE	*Castilleja rhexifolia* Rydb.
CAST SES	*Castilleja sessiliflora* Pursh
CAST SPP	*Castilleja* spp.
CATA AQU	*Catabrosa aquatica* (L.) Beauverd
CENT CYA	*Centaurea cyanus* L.
CENT DIF	*Centaurea diffusa* Lam.
CENT MAC	*Centaurea maculosa* auct. non Lam.
CENT MIN	*Centunculus minimus* L.
CENT REP	*Centaurea repens* (L.) DC.
CENT SOL	*Centaurea solstitialis* L.
CERA ARV	*Cerastium arvense* L.
CERA BEE	*Cerastium beeringianum* Cham. & Schlecht.
CERA DEM	*Ceratophyllum demersum* L.
CERA NUT	*Cerastium nutans* Raf.
CERA SPP	*Cerastium* spp.
CERA VUL	*Cerastium vulgatum* L.

Appendix 1C. Continued

FECD code	Scientific name
CHAE DOU	*Chaenactis douglasii* (Hook.) Hook. & Arn.
CHAE MIN	*Chaenorrhinum minus* (L.) Lange
CHAM ERE	*Chamaerhodos erecta* (L.) Bunge
CHAM GRA	*Chamaesaracha grandiflora* (Hook.) Fern.
CHEI FEE	*Cheilanthes feei* T. Moore
CHEI GRA	*Cheilanthes gracillima* D.C. Eaton
CHEN ALB	*Chenopodium album* L.
CHEN ATR	*Chenopodium atrovirens* Rydb.
CHEN BER	*Chenopodium berlandieri* Moq.
CHEN BON	*Chenopodium bonus-henricus* L.
CHEN CAP	*Chenopodium capitatum* (L.) Ambrosi
CHEN DES	*Chenopodium desiccatum* A. Nels.
CHEN FRE	*Chenopodium fremontii* S. Wats.
CHEN GIG	*Chenopodium gigantospermum* Aellen
CHEN INC	*Chenopodium incanum* (S. Wats.) Heller
CHEN LEP	*Chenopodium leptophyllum* (Moq.) Nutt. ex S. Wats.
CHEN PRA	*Chenopodium pratericola* Rydb.
CHEN RUB	*Chenopodium rubrum* L.
CHEN SAL	*Chenopodium salinum* Standl.
CHEN SPP	*Chenopodium* spp.
CHEN SUB	*Chenopodium subglabrum* (S. Wats.) A. Nels.
CHEN WAT	*Chenopodium watsonii* A. Nels.
CHRY IOW	*Chrysosplenium iowense* Rydb.
CHRY LEU	*Chrysanthemum leucanthemum* L.
CHRY TET	*Chrysosplenium tetrandrum* (Lund ex Malmgr.) Th. Fries
CICH END	*Cichorium endivia* L.
CICH INT	*Cichorium intybus* L.
CICU BUL	*Cicuta bulbifera* L.
CICU MAC	*Cicuta maculata* L.
CICU VIR	*Cicuta virosa* L.
CINN LAT	*Cinna latifolia* (Trev. ex Goepp.) Griseb.
CIRC ALP	*Circaea alpina* L.
CIRC SPP	*Circaea* spp.
CIRS ARV	*Cirsium arvense* (L.) Scop.
CIRS DRU	*Cirsium drummondii* Torr. & Gray
CIRS FLO	*Cirsium flodmanii* (Rydb.) Arthur
CIRS FOL	*Cirsium foliosum* (Hook.) DC.
CIRS HOO	*Cirsium hookerianum* Nutt.
CIRS SCA	*Cirsium scariosum* Nutt.
CIRS SPP	*Cirsium* spp.
CIRS UND	*Cirsium undulatum* (Nutt.) Spreng.
CIRS VUL	*Cirsium vulgare* (Savi) Ten.
CLAY LAN	*Claytonia lanceolata* Pall. ex Pursh
CLAY MEG	*Claytonia megarhiza* (Gray) Parry ex S. Wats.
CLAY SPP	*Claytonia* spp.
CLEM SPP	*Clematis* spp.
CLEO SER	*Cleome serrulata* Pursh
CLIN UNI	*Clintonia uniflora* (Menzies ex J.A. & J.H. Schultes) Kunth
COLL LIN	*Collomia linearis* Nutt.
COLL PAR	*Collinsia parviflora* Lindl.
COMA UMB	*Comandra umbellata* (L.) Nutt.
CONI MAC	*Conium maculatum* L.
CONI WIL	*Conimitella williamsii* (D.C. Eaton) Rydb.
CONR ORI	*Conringia orientalis* (L.) Dumort.
CONV ARV	*Convolvulus arvensis* L.
CONV SEP	*Convolvulus sepium* (L.) R. Br.
COPT TRI	*Coptis trifolia* (L.) Salisb.
CORA MAC	*Corallorrhiza maculata* (Raf.) Raf.
CORA SPP	*Corallorrhiza* spp.
CORA STR	*Corallorrhiza striata* Lindl.
CORA TRI	*Corallorrhiza trifida* Chatelain
CORE TIN	*Coreopsis tinctoria* Nutt.
CORI HYS	*Corispermum hyssopifolium* L. p. p.
CORI NIT	*Corispermum nitidum* Kit. ex J.A. Schultes
CORN CAN	*Cornus canadensis* L.
CORO VAR	*Coronilla varia* L.
CORY AUR	*Corydalis aurea* Willd.
CORY SEM	*Corydalis sempervirens* (L.) Pers.
CORY VIV	*Coryphantha vivipara* (Nutt.) Britt. & Rose
CREP ATR	*Crepis atrabarba* Heller
CREP CAP	*Crepis capillaris* (L.) Wallr.
CREP ELE	*Crepis elegans* Hook.
CREP INT	*Crepis intermedia* Gray
CREP NAN	*Crepis nana* Richards.
CREP OCC	*Crepis occidentalis* Nutt.
CREP RUN	*Crepis runcinata* (James) Torr. & Gray
CREP TEC	*Crepis tectorum* L.
CRYP ACR	*Cryptogramma acrostichoides* R. Br.
CRYP FEN	*Cryptantha fendleri* (Gray) Greene
CRYP MAC	*Cryptantha macounii* (Eastw.) Payson
CRYP MIN	*Cryptantha minima* Rydb.
CRYP NUB	*Cryptantha nubigena* (Greene) Payson
CRYP STE	*Cryptogramma stelleri* (Gmel.) Prantl
CUSC GRO	*Cuscuta gronovii* (Willd. ex J.A. Schultes
CYMO ACA	*Cymopteris acaulis* (Pursh) Raf.
CYNO BOR	*Cynoglossum boreale* Fern.
CYNO OFF	*Cynoglossum officinale* L.
CYPE SCH	*Cyperus schweinitzii* Torr.
CYPE SQU	*Cyperus squarrosus* L.
CYPR ACA	*Cypripedium acaule* Ait.
CYPR CAL	*Cypripedium calceolus* L.
CYPR MON	*Cypripedium montanum* Dougl. ex Lindl.
CYPR PAS	*Cypripedium passerinum* Richards.
CYPR SPP	*Cypripedium* spp.
CYST FRA	*Cystopteris fragilis* (L.) Bernh.
CYST MON	*Cystopteris montana* (Lam.) Bernh. ex Desv.
DACT GLO	*Dactylis glomerata* L.
DANT CAL	*Danthonia californica* Boland.
DANT PAR	*Danthonia parryi* Scribn.
DANT SPI	*Danthonia spicata* (L.) Beaverd ex Roemer & J.A. Schultes
DANT SPP	*Danthonia* spp.
DANT UNI	*Danthonia unispicata* (Thurb.) Munro ex Macoun
DELP BIC	*Delphinium bicolor* Nutt.
DELP GLA	*Delphinium glaucum* S. Wats.
DELP NUT	*Delphinium nuttallianum* Pritz ex Walp.
DELP SPP	*Delphinium* spp.
DESC CES	*Deschampsia cespitosa* (L.) Beauverd

Appendix 1C. Continued

FECD code	Scientific name
DESC ELO	*Deschampsia elongata* (Hook.) Munro
DESC PIN	*Descurainia pinnata* (Walt.) Britt.
DESC RIC	*Descurainia richardsonii* O.E. Schulz
DESC SOP	*Descurainia sophia* (L.) Webb ex Prantl
DESC SPP	*Deschampsia* spp.
DIAN BAR	*Dianthus barbatus* L.
DIAN DEL	*Dianthus deltoides* L.
DIAN PLU	*Dianthus plumarius* L.
DIAN SEG	*Dianthus seguieri* Vill.
DICA ACU	*Dichanthelium acuminatum* (Sw.) Gould & C.A. Clarke
DICA LEI	*Dichanthelium leibergii* (Vasey) Freckman
DICA OLI	*Dichanthelium oligosanthes* (J.A. Schultes) Gould
DIGI ISC	*Digitaria ischaemum* (Schreb.) Schreb. ex Muhl.
DIGI SAN	*Digitaria sanguinalis* (L.) Scop.
DIPL MUR	*Diplotaxis muralis* (L.) DC.
DISP HOO	*Disporum hookeri* (Torr.) Nichols.)
DISP SPP	*Disporum* spp.
DISP TRA	*Disporum trachycarpum* (S. Wats.) Benth. & Hook. f.
DIST STR	*Distichlis stricta* (L.) Greene
DODE CON	*Dodecatheon conjugens* Greene
DODE PUL	*Dodecatheon pulchellum* (Raf.) Merr.
DODE SPP	*Dodecatheon* spp.
DOUG MON	*Douglasia montana* Gray
DOWN LAE	Downingia laeta (Greene) Greene
DRAB ALB	*Draba albertina* Greene
DRAB AUR	*Draba aurea* Vahl ex Hornem.
DRAB BOR	*Draba borealis* DC.
DRAB CAN	*Draba cana* Rydb.
DRAB CRA	*Draba crassifolia* Graham
DRAB DEN	*Draba densifolia* Nutt.
DRAB FLA	*Draba fladnizensis* Wulfen
DRAB GLA	*Draba glabella* Pursh
DRAB INC	*Draba incerta* Payson
DRAB KAN	*Draba kananaskis* Mulligan
DRAB LOG	*Draba longipes* Raup
DRAB LON	*Draba lonchocarpa* Rydb.
DRAB MAC	*Draba macounii* O.E. Schulz
DRAB NEM	*Draba nemorosa* L.
DRAB NIV	*Draba nivalis* Lilj.
DRAB OLI	*Draba oligosperma* Hook.
DRAB PAY	*Draba paysonii* J.F. Macbr.
DRAB POR	*Draba porsildii* Mulligan
DRAB PRA	*Draba praealta* Greene
DRAB REP	*Draba reptans* Lam.) Fern.
DRAB SPP	*Draba* spp.
DRAB STE	*Draba stenoloba* Ledeb.
DRAB VEN	*Draba ventosa* Gray
DRAB VER	*Draba verna* L.
DRAC PAR	*Dracocephalum parviflorum* Nutt.
DRAC THY	*Dracocephalum thymiflorum* L.
DROS ANG	*Drosera anglica* Huds.
DROS LIN	*Drosera linearis* Goldie
DROS ROT	*Drosera rotundifolia* L.
DRYO ASS	*Dryopteris assimilis* S. Walker
DRYO CAR	*Dryopteris carthusiana* (Vill.) H.P. Fuchs
DRYO CRI	*Dryopteris cristata* (L.) Gray
DRYO FIL	*Dryopteris filix-mas* (L.) Schott
DRYO FRA	*Dryopteris fragrans* (L.) Schott
DRYO SPP	*Dryopteris* spp.
ECHI CRU	*Echinochloa crus-galli* (L.) Beauverd
ECHI LOB	*Echinocystis lobata* (Michx.) Torr. & Gray
ECHI VUL	*Echium vulgare* L.
ELAT TRI	*Elatine triandra* Schkuhr
ELEO ACI	*Eleocharis acicularis* (L.) Roemer & J.A. Schultes
ELEO COM	*Eleocharis compressa* Sullivant
ELEO OVA	*Eleocharis ovata* (Roth) Roemer & J.A. Schultes
ELEO PAL	*Eleocharis palustris* (L.) Roemer & J.A. Schultes
ELEO QUI	*Eleocharis quinqueflora* (F.X. Hartmann) Schwartz
ELEO SPP	*Eleocharis* spp.
ELLI NYC	*Ellisia nyctelea* (L.) L.
ELOD LON	*Elodea longivaginita* St. John
ELYM CAN	*Elymus canadensis* L.
ELYM GLA	*Elymus glaucus* Buckl.
ELYM INN	*Elymus innovatus* Beal
ELYM JUN	*Elymus junceus* Fisch.
ELYM MOL	*Elymus mollis* Trin.
ELYM PIP	*Elymus piperi* Bowden
ELYM SPP	*Elymus* spp.
ELYM VIR	*Elymus virginicus* L.
EMPE NIG	*Empetrum nigrum* L.
EPIL ANA	*Epilobium anagallidifolium* Lam.
EPIL ANG	*Epilobium angustifolium* L.
EPIL CIL	*Epilobium ciliatum* Raf.
EPIL CLA	*Epilobium clavatum* Trel.
EPIL GLA	*Epilobium glaberrimum* Barbey
EPIL HAL	*Epilobium halleanum* Haussken.
EPIL HOR	*Epilobium hornemannii* Reichenb.
EPIL LAC	*Epilobium lactiflorum* Hausskn.
EPIL LAT	*Epilobium latifolium* L.
EPIL LEP	*Epilobium leptocarpum* Hausskn.
EPIL LET	*Epilobium leptophyllum* Raf.
EPIL LUT	*Epilobium luteum* Pursh
EPIL MIR	*Epilobium mirabile* Trel. ex Piper
EPIL PAL	*Epilobium palustre* L.
EPIL PAN	*Epilobium paniculatum* Nutt. ex Torr. & Gray
EPIL SAX	*Epilobium saximontanum* Hausskn
EPIL SPP	*Epilolobium* spp.
EQUI ARV	*Equisetum arvense* L.
EQUI FLU	*Equisetum fluviatile* L.
EQUI HYE	*Equisetum hyemale* L.
EQUI LAE	*Equisetum laevigatum* A. Braun
EQUI PAL	*Equisetum palustre* L.
EQUI PRA	*Equisetum pratense* Ehrh.
EQUI SCI	*Equisetum scirpoides* Michx.
EQUI SPP	*Equisetum* spp.
EQUI SYL	*Equisetum sylvaticum* L.
EQUI VAR	*Equisetum variegatum* Schleich ex F. Weber & D.M.H. Mohr
ERAG MEG	*Eragrostis megastachya* (Koel.) Link
EREM TRI	*Eremopyrum triticeum* (Gaertn.) Nevski
ERIG ACR	*Erigeron acris* L.

Appendix 1C. Continued

FECD code	Scientific name
ERIG ANN	*Erigeron annuus* (L.) Pers.
ERIG ART	*Erigeron* x *arthurii* Boivin
ERIG AUR	*Erigeron aureus* Greene
ERIG CAE	*Erigeron caespitosus* Nutt.
ERIG CAN	*Erigeron canadensis* (L.) Cronq.
ERIG COM	*Erigeron compositus* Pursh
ERIG DIV	*Erigeron divergens* Torr. & Gray
ERIG ELA	*Erigeron elatus* (Hook.) Greene
ERIG FLA	*Erigeron flagellaris* Gray
ERIG GLA	*Erigeron glabellus* Nutt.
ERIG GRA	*Erigeron grandiflorus* Hook.
ERIG HUM	*Erigeron humilis* Graham
ERIG HYS	*Erigeron hyssopifolius* Michx.
ERIG LAN	*Erigeron lanatus* Hook.
ERIG LON	*Erigeron lonchophyllus* Hook.
ERIG OCH	*Erigeron ochroleucus* Nutt.
ERIG PER	*Erigeron peregrinus* (Banks ex Pursh) Greene
ERIG PHI	*Erigeron philadelphicus* L.
ERIG PUM	*Erigeron pumilus* Nutt.
ERIG PUR	*Erigeron purpuratus* Greene
ERIG RAD	*Erigeron radicatus* Hook.
ERIG SPE	*Erigeron speciosus* (Lindl.) DC.
ERIG SPP	*Erigonum* spp.
ERIG TRI	*Erigeron trifidus* Hook.
ERIO AND	*Eriogonum androsaceum* Benth.
ERIO BRA	*Eriophorum brachyantherum* Trautv. & C.A. Mey.
ERIO CAL	*Eriophorum callitrix* Cham. ex C.A. Mey
ERIO CER	*Eriogonum cernuum* Nutt.
ERIO CHA	*Eriophorum chamissonis* C.A. Mey.
ERIO FLA	*Eriogonum flavum* Nutt.
ERIO GRA	*Eriophorum gracile* Benth.
ERIO OVA	*Eriogonum ovalifolium* Nutt.
ERIO POL	*Eriophorum polystachion* L. p. p.
ERIO SCH	*Eriophorum scheuchzeri* Hoppe
ERIO SPP	*Eriophorum* spp.
ERIO VAG	*Eriophorum vaginatum* L.
ERIO VIR	*Eriophorum viridicarinatum* (Engelm.) Fern.
EROD CIC	*Erodium cicutarium* (L.) L'Hér. ex Ait.
ERUC GAL	*Erucastrum gallicum* (Willd.) O.E. Schulz
ERUC SAT	*Eruca sativa* P. Mill.
ERYN PLA	*Eryngium planum* L.
ERYS ASP	*Erysimum asperum* (Nutt.) DC.
ERYS CHE	*Erysimum cheiranthoides* L.
ERYS INC	*Erysimum inconspicuum* (S. Wats.) MacM
ERYS PAL	*Erysimum pallasii* (Pursh) Fern.
ERYS SPP	*Erysimum* spp.
ERYT GRA	*Erythronium grandiflorum* Pursh
EUPA MAC	*Eupatorium maculatum* L.
EUPH ARC	*Euphrasia arctica* Lange ex Rostr.
EUPH ESU	*Euphorbia esula* L.
EUPH GLY	*Euphorbia glyptosperma* Engelm.
EUPH HEL	*Euphorbia helioscopia* L.
EUPH PEP	*Euphorbia peplus* L.
EUPH SER	*Euphorbia serpyllifolia* Pers.
EURO LAN	*Eurotia lanata* (Pursh) Moq.
FAGO ESC	*Fagopyrum esculentum* Moench
FAGO TAR	*Fagopyrum tartaricum* (L.) Gaertn.
FEST BAF	*Festuca baffinensis* Polunin
FEST BRA	*Festuca brachyphylla* J.A. Schultes ex J.A. & J.H. Schultes
FEST IDA	*Festuca idahoensis* Elmer
FEST OCC	*Festuca occidentalis* Hook.
FEST OVI	*Festuca ovina* L.
FEST PRA	*Festuca pratensis* Huds.
FEST RUB	*Festuca rubra* L.
FEST SAX	*Festuca saximontana* Rydb.
FEST SCA	*Festuca scabrella* Torr. ex Hook.
FEST SPP	*Festuca* spp.
FEST SUB	*Festuca subulata* Trin.
FRAG VES	*Fragaria vesca* L.
FRAG VIR	*Fragaria virginiana* Duchesne
FRAN ACA	*Franseria acanthicarpa* Hook.) Coville
FRIT PUD	*Fritillaria pudica* (Pursh) Spreng.
GAIL ARI	*Gaillardia aristata* Pursh
GALE SPE	*Galeopsis speciosa* Mill.
GALE TET	*Galeopsis tetrahit* L.
GALI APA	*Galium aparine* L.
GALI BOR	*Galium boreale* L.
GALI CIL	*Galinsoga ciliata* (Raf.) Blake
GALI LAB	*Galium labradoricum* (Wieg.) Wieg.
GALI SPP	*Galium* spp.
GALI SPU	*Galium spurium* L.
GALI TRF	*Galium trifidum* L.
GALI TRI	*Galium triflorum* Michx.
GALI VER	*Galium verum* L.
GAUL HIS	*Gaultheria hispidula* (L.) Muhl. ex Bigelow
GAUR COC	*Gaura coccinea* Nutt. ex Pursh
GAYO RAC	*Gayophytum racemosum* Torr. & Gray
GENT AFF	*Gentiana affinis* Griseb.
GENT AMA	*Gentianella amarella* (L.) Boerner
GENT AQU	*Gentiana aquatica* auct. non L.
GENT CAL	*Gentiana calycosa* Griseb.
GENT CRI	*Gentianella crinita* (Froel.) G. Don
GENT DET	*Gentianella detonsa* (Rotlb.) G. Don
GENT GLA	*Gentiana glauca* Pallas
GENT PRO	*Gentiana prostrata* Haenke
GENT PRP	*Gentianella propinqua* (Richards.) J. Gillett
GENT SPP	*Gentiana* spp.
GEOC LIV	*Geocaulon lividum* (Richards.) Fern.
GERA BIC	*Geranium bicknellii* Britt.
GERA CAR	*Geranium carolinianum* L.
GERA ERI	*Geranium erianthum* DC.
GERA RIC	*Geranium richardsonii* Fisch. & Trautv.
GERA SPP	*Geranium* spp.
GERA VIS.	*Geranium viscosissimum* Fisch. & C.A. Mey ex C.A. Mey
GEUM ALE	*Geum aleppicum* Jacq.
GEUM MAC	*Geum macrophyllum* Willd.
GEUM RIV	*Geum rivale* L.
GEUM SPP	*Geum* spp.
GEUM TRI	*Geum triflorum* Pursh
GLAU MAR	*Glaux maritima* L.
GLEC HED	*Glecoma hederacea* L.
GLYC BOR	*Glyceria borealis* (Nash) Batchelder

Appendix 1C. Continued

FECD code	Scientific name
GLYC ELA	*Glyceria elata* (Nash ex Rydb.) M.E. Jones
GLYC GRA	*Glyceria grandis* S. Wats.
GLYC LEP	*Glycyrrhiza lepidota* Pursh
GLYC PUL	*Glyceria pulchella* (Nash) K. Schum.
GLYC STR	*Glyceria striata* (Lam.) A.S. Hitchc.
GNAP MIC	*Gnaphalium microcephalum* Nutt.
GNAP PAL	*Gnaphalium palustre* Nutt.
GNAP ULI	*Gnaphalium uliginosum* L.
GNAP VIS	*Gnaphalium viscosum* Kunth
GOOD OBL	*Goodyera oblongifolia* Raf.
GOOD REP	*Goodyera repens* (L.) R. Br. ex Ait. f.
GOOD SPP	*Goodyera* spp.
GRAT NEG	*Gratiola neglecta* Torr.
GRIN SQU	*Grindelia squarrosa* (Pursh) Dunal
GUTI SAR	*Gutierrezia sarothrae* (Pursh) Britt. & Rusby
GYMN DRY	*Gymnocarpium dryopteris* (L.) Newman
GYMN JES	*Gymnocarpium jessoense* (Koidzumi) Koidzumi
GYPS ELE	*Gypsophila elegans* Bieb.
GYPS PAN	*Gypsophila paniculata* L.
GYPS SCO	*Gypsophila scorzonerifolia* Ser.
HABE DIL	*Habenaria dilatata* (Pursh) Lindl. ex Beck
HABE HYP	*Habenaria hyperborea* (L.) Lindl.
HABE OBT	*Habenaria obtusata* (Banks ex Pursh) Lindl.
HABE ORB	*Habenaria orbiculata* (Pursh) Lindl.
HABE SAC	*Habenaria saccata* Greene
HABE SPP	*Habenaria* spp.
HABE UNA	*Habenaria unalascencis* (Spreng) S. Wats.
HABE VIR	*Habenaria viridis* (L.) R. Br. ex Ait. f.
HACK AME	*Hackelia americana* (Gray) Fern.
HACK FLO	*Hackelia floribunda* Lehm.) I.M. Johnston
HACK JES	*Hackelia jessicae* (McGregor) Brand
HACK SPP	*Hackelia* spp.
HALE DEF	*Halenia deflexa* (Sm.) Griseb.
HALI VIR	*Halimolobos virgata* (Nutt.) O.E. Schulz
HAPL LAN	*Haplopappus lanceolatus* (Hook.) Torr. & Gray
HAPL LYA	*Haplopappus lyallii* Gray
HAPL SPI	*Haplopappus spinulosus* (Push) DC.
HAPL UNI	*Haplopappus uniflorus* (Hook.) Torr. & Gray
HEDE HIS	*Hedeoma hispida* Pursh
HEDY ALP	*Hedysarum alpinum* L.
HEDY BOR	*Hedysarum boreale* Nutt.
HEDY SPP	*Hedysarum* spp.
HEDY SUL	*Hedysarum sulphurescens* Rydb.
HELE AUT	*Helenium autumnale* L.
HELI ANN	*Helianthus annuus* L.
HELI COU	*Helianthus couplandii* Bouvin
HELI CUR	*Heliotropium curassavicum* L.
HELI HOO	*Helictotrichon hookeri* (Scribn.) Henr.
HELI MAX	*Helianthus maximiliani* Schrad.
HELI NUT	*Helianthus nuttallii* Torr. & Gray
HELI SUB	*Helianthus subrhomboideus* Rydb.
HERA LAN	*Heracleum lanatum* Michx.
HERA SPP	*Heracleum* spp.
HESP MAT	*Hesperis matronalis* L.
HETE SPP	*Heterotheca* spp.
HETE VIL	*Heterotheca villosa* (Pursh) Shinners
HEUC CYL	*Heuchera cylindrica* Dougl. ex Hook.
HEUC GLA	*Heuchera glabra* Willd. ex Roemer & J.A. Schultes
HEUC PAR	*Heuchera parvifolia* Bartl.
HEUC RIC	*Heuchera richardsonii* R. Br.
HIER ALB	*Hieracium albiflorum* Hook.
HIER ALP	*Hierochloe alpina* (Sw. ex Willd.) Roemer & J.A. Schultes
HIER AUR	*Hieracium aurantiacum* L.
HIER CYN	*Hieracium cynoglossoides* Arv.-Touv.
HIER ODO	*Hierochloe odorata* (L.) Beauverd
HIER SPP	*Hierachloe* spp.
HIER TRI	*Hieracium triste* Willd. ex Spreng.
HIER UMB	*Hieracium umbellatum* L.
HIPP MON	*Hippuris montana* Ledeb.
HIPP VUL	*Hippuris vulgaris* L.
HORD GLA	*Hordeum glaucum* Steud.
HORD JUB	*Hordeum jubatum* L.
HORD PUS	*Hordeum pusillum* Nutt.
HORD VUL	*Hordeum vulgare* L.
HOUS LON	*Houstonia longifolia* Gaertn.
HUDS TOM	*Hudsonia tomentosa* Nutt.
HUMU LUP	*Humulus lupulus* L.
HYDR CAP	*Hydrophyllum capitatum* Dougl. ex Benth.
HYME ACA	*Hymenoxys acaulis* (Pursh) Parker
HYME FIL	*Hymenopappus filifolius* Hook.
HYME RIC	*Hymenoxys richardsonii* (Hook.) Cockerll
HYOS NIG	*Hyoscyamus niger* L.
HYPE FOR	*Hypericum formosum* Kunth
HYPE MAJ	*Hypericum majus* (Gray) Britt.
ILIA RIV	*Iliamna rivularis* (Dougl. ex Hook.) Greene
IMPA CAP	*Impatiens capensis* Meerb.
IMPA NOL	*Impatiens noli-tangere* L.
IRIS MIS	*Iris missouriensis* Nutt.
ISOE BOL	*Isoetes bolanderi* Engelm.
ISOE ECH	*Isoetes echinospora* Durieu
IVA ANT	*Iva xanthifolia* Nutt.
IVA XIL	*Iva axillaris* Pursh
JUNC ALB	*Juncus albescens* (Lange) Fern.
JUNC ALP	*Juncus alpinoarticulatus* Chaix
JUNC BAL	*Juncus balticus* Willd.
JUNC BIG	*Juncus biglumis* L.
JUNC BRE	*Juncus brevicaudatus* (Engelm.) Fern.
JUNC BUF	*Juncus bufonius* L.
JUNC CAS	*Juncus castaneus* Sm.
JUNC CON	*Juncus confusus* Coville
JUNC DRU	*Juncus drummondii* E. Mey.
JUNC ENS	*Juncus ensifolius* Wikstr.
JUNC FIL	*Juncus filiformis* L.
JUNC LON	*Juncus longistylis* Torr.
JUNC MER	*Juncus mertensianus* Bong.
JUNC NEV	*Juncus nevadensis* S. Wats.
JUNC NOD	*Juncus nodosus* L.
JUNC PAR	*Juncus parryi* Engelm.
JUNC REG	*Juncus regelii* Buch.
JUNC SPP	*Juncus* spp.

Appendix 1C. Continued

FECD code	Scientific name
JUNC STY	*Juncus stygius* L.
JUNC TEN	*Juncus tenuis* Willd.
JUNC TOR	*Juncus torreyi* Coville
JUNC TRA	*Juncus tracyi* Rydb.
JUNC VAS	*Juncus vaseyi* Engelm.
KNAU ARV	*Knautia arvensis* (L.) Coult.
KOBR MYO	*Kobresia myosuroides* (Vill.) Fiori
KOBR SIM	*Kobresia simpliciuscula* (Wahlenb.) Mackenzie
KOBR SPP	*Kobresia* spp.
KOCH SCO	*Kochia scoparia* (L.) Schrad.
KOEL MAC	*Koeleria macrantha* (Ledeb.) J.A. Schultes
KOEN ISL	*Koenigia islandica* L.
LACT BIE	*Lactuca biennis* (Moench) Fern.
LACT PUL	*Lactuca pulchella* (Pursh) DC.
LACT SER	*Lactuca serriola* L.
LAMI AMP	*Lamium amplexicaule* L.
LAPP OCC	*Lappula occidentalis* (S. Wats.) Greene
LAPP SQU	*Lappula squarrosa* (Retz.) Dumort.
LAPS COM	*Lapsana communis* L.
LATH OCH	*Lathyrus ochroleucus* Hook.
LATH VEN	*Lathyrus venosus* Muhl. ex Willd.
LEMN MIN	*Lemna minor* L.
LEMN TRI	*Lemna trisulca* L.
LEON CAR	*Leonurus cardiaca* L.
LEPI BOU	*Lepidium bourgeauanum* Thellung
LEPI CAM	*Lepidium campestre* (L.) Ait. f.
LEPI DEN	*Lepidium densiflorum* Schrad.
LEPI LAT	*Lepidium latifolium* L.
LEPI PER	*Lepidium perfoliatum* L.
LEPI RAM	*Lepidium ramosissimum* A. Nels.
LEPI SAT	*Lepidium sativum* L.
LEPT PYR	*Leptarrhena pyrolifolia* (D. Don) R. Br. ex Ser.
LESQ ALP	*Lesquerella alpina* (Nutt.) S. Wats.
LESQ ARC	*Lesquerella arctica* (Wormsk. ex Hornem) S. Wats.
LESQ ARE	*Lesquerella arenosa* (Richards.) Rydb.
LEWI PYG	*Lewisia pygmaea* (Gray) B.L. Robins.
LIAT LIG	*Liatris ligulistylis* (A. Nels.) K. Schum.
LIAT PUN	*Liatris punctata* Hook.
LILA SCI	*Lilaea scilloides* (Poir.) Hauman
LILI PHI	*Lilium philadelphicum* L.
LIMO AQU	*Limosella aquatica* L.
LINA DAL	*Linaria dalmatica* (L.) P. Mill.
LINA SEP	*Linanthus septentrionalis* Mason
LINA VUL	*Linaria vulgaris* P. Mill.
LINN BOR	*Linnaea borealis* L.
LINU LEW	*Linum lewisii* Pursh
LINU RIG	*Linum rigidum* Pursh
LINU SPP	*Linum* spp.
LINU USI	*Linum usitatissimum* L.
LIST BOR	*Listera borealis* Morong
LIST CAU	*Listera caurina* Piper
LIST CON	*Listera convallarioides* (Sw.) Nutt. ex Ell.
LIST COR	*Listera cordata* (L.) R. Br. ex Ait. f.
LIST SPP	*Listera* spp.
LITH INC	*Lithospermum incisum* Lehm.
LITH PAR	*Lithophragma parviflorum* (Hook.) Nutt. ex Torr. & Gray
LITH RUD	*Lithospermum ruderale* Dougl. ex Lehm.
LOBE DOR	*Lobelia dortmanna* L.
LOBE KAL	*Lobelia kalmii* L.
LOBE SPI	*Lobelia spicata* Lam.
LOLI MUL	*Lolium multiflorum* Lam.
LOLI PER	*Lolium perenne* L.
LOLI PES	*Lolium persicum* Boiss. & Hohen. ex Boiss.
LOLI TEM	*Lolium temulentum* L.
LOMA COU	*Lomatium cous* (S. Wats.) Coult. & Rose
LOMA DIS	*Lomatium dissectum* (Nutt.) Mathias & Constance
LOMA FOE	*Lomatium foeniculaceum* (Nutt.) Coult. & Rose
LOMA MAC	*Lomatium macrocarpum* (Nutt. ex Torr. & Gray) Coult & Rose
LOMA ROT	*Lomatogonium rotatum* (L.) Fries ex Fern.
LOMA SAN	*Lomatium sandbergii* (Coult. & Rose) Coult. & Rose
LOMA SPP	*Lomatium* spp.
LOMA TRI	*Lomatium triternatum* (Pursh) Coult. & Rose
LOTU COR	*Lotus corniculatus* L.
LUPI ARG	*Lupinus argenteus* Pursh
LUPI LEP	*Lupinus lepidus* Dougl. ex Lindl.
LUPI MIN	*Lupinus minimus* Dougl. ex Hook.
LUPI NOO	*Lupinus nootkatensis* Donn ex Sims.
LUPI POL	*Lupinus polyphyllus* Lindl.
LUPI PUS	*Lupinus pusillus* Pursh
LUPI SER	*Lupinus sericeus* Pursh
LUPI SPP	*Lupinus* spp.
LUZU ACU	*Luzula acuminata* Raf.
LUZU ARC	*Luzula arcuata* (Wahlenb.) Sw.
LUZU GRO	*Luzula groenlandica* Böcher
LUZU HIT	*Luzula hitchcockii* Hämet-Ahti
LUZU MUL	*Luzula multiflora* (Ehrh.) Lej.
LUZU PAR	*Luzula parviflora* (Ehrh.) Desv.
LUZU PIP	*Luzula piperi* (Coville) M.E. Jones
LUZU RUF	*Luzula rufescens* (Fisch. ex E. Mey.
LUZU SPI	*Luzula spicata* (L.) DC.
LUZU SPP	*Luzula* spp.
LYCO ALP	*Lycopodium alpinum* L.
LYCO AME	*Lycopus americanus* Muhl ex W. Bart.
LYCO ANN	*Lycopodium annotinum* L.
LYCO ARV	*Lycopsis arvensis* L.
LYCO ASP	*Lycopus asper* Greene
LYCO CLA	*Lycopodium clavatum* L.
LYCO COM	*Lycopodium complanatum* L.
LYCO INU	*Lycopodium inundatum* L.
LYCO OBS	*Lycopodium obscurum* L.
LYCO SEL	*Lycopodium selago* L.
LYCO SIT	*Lycopodium sitchense* Rupr.
LYCO SPP	*Lycopsis* spp.
LYCO UNI	*Lycopus uniflorus* Michx.
LYGO JUN	*Lygodesmia juncea* (Pursh) D. Don ex Hook.
LYGO ROS	*Lygodesmia rostrata* (Gray) Gray
LYSI CIL	*Lysimachia ciliata* L.
LYSI LAN	*Lysimachia lanceolata* Walt.

Appendix 1C. Continued

FECD code	Scientific name
LYSI THY	*Lysimachia thyrsiflora* L.
LYTH SAL	*Lythrum salicaria* L.
LYTH SPP	*Lythrum* spp.
MACH CAN	*Machaeranthera canescens* (Pursh) Gray
MACH GRI	*Machaeranthera grindelioides* (Nutt.) Shinners
MACH TAN	*Machaeranthera tanacetifolia* (Kunth) Nees
MADI GLO	*Madia glomerata* Hook.
MAIA CAN	*Maianthemum canadense* Desf.
MAIA SPP	*Maianthemum* spp.
MALA MON	*Malaxis monophyllos* (L.) Sw.
MALA PAL	*Malaxis paludosa* (L.) Sw.
MALV PAR	*Malva parviflora* L.
MALV ROT	*Malva rotundifolia* L.
MALV SYL	*Malva sylvestris* L.
MALV VER	*Malva verticillata* L.
MARS VES	*Marsilea vestita* Hook. & Grev.
MATR MAT	*Matricaria matricarioides* auct. non (Less.) Porter
MATR PER	*Matricaria perforata* Mérat
MATR REC	*Matricaria recutita* L.
MATT STR	*Matteuccia struthiopteris* (L.) Todaro
MEDI FAL	*Medicago falcata* L.
MEDI LUP	*Medicago lupulina* L.
MEDI SAT	*Medicago sativa* L.
MELA LIN	*Melampyrum lineare* Desr.
MELI ALB	*Melilotus alba* Medikus
MELI OFF	*Melilotus officinalis* (L.) Lam.
MELI SMI	*Melica smithii* (Porter ex Gray) Vasey
MELI SPE	*Melica spectabilis* Scribn.
MELI SPP	*Melica* spp.
MELI SUB	*Melica subulata* (Griseb.) Scribn.
MENT ARV	*Mentha arvensis* L.
MENT DEC	*Mentzelia decapetala* (Pursh ex Sims) Urban & Gilg ex Gilg
MENT SPI	*Mentha spicata* L.
MENY TRI	*Menyanthes trifoliata* L.
MERT LAN	*Mertensia lanceolata* (Pursh) DC.
MERT LON	*Mertensia longiflora* Greene
MERT PAN	*Mertensia paniculata* (Ait.) G. Don
MERT SPP	*Mertensia* spp.
MICR GRA	*Microsteris gracilis* (Hook.) Greene
MICR NUT	*Microseris nutans* (Hook.) Schultz-Bip.
MIMU FLO	*Mimulus floribundus* Lindl.
MIMU GUT	*Mimulus guttatus* DC.
MIMU LEW	*Mimulus lewisii* Pursh
MINU AUS	*Minuartia austromontana* S.J. Wolf & Packer
MINU BIF	*Minuartia biflora* (L.) Schinz & Thellung
MINU DAW	*Minuartia dawsonensis* (Britt.) House
MINU ELE	*Minuartia elegans* (Cham. & Schlecht.) Schischkin
MINU NUT	*Minuartia nuttallii* (Pax) Briq.
MINU OBT	*Minuartia obtusiloba* (Rydb.) House
MINU RUB	*Minuartia rubella* (Wahlenb.) Hiern.
MIRA HIR	*Mirabilis hirsuta* (Pursh) MacM.
MIRA NYC	*Mirabilis nyctaginea* (Michx.) MacM.
MITE BRE	*Mitella breweri* Gray
MITE NUD	*Mitella nuda* L.
MITE PEN	*Mitella pentandra* Hook.
MITE SPP	*Mitella* spp.
MITE TRI	*Mitella trifida* Graham
MOEH LAT	*Moehringia lateriflora* (L.) Fenzl
MONA FIS	*Monarda fistulosa* L.
MONE SPP	*Moneses* spp.
MONE UNI	*Moneses uniflora* (L.) Gray
MONO HYP	*Monotropa hypopithys* L.
MONO NUT	*Monolepis nuttalliana* (J.A. Schultes) Greene
MONO UNI	*Monotropa uniflora* L.
MONT LIN	*Montia linearis* (Dougl. ex Hook.) Greene
MONT PAR	*Montia parvifolia* (Moc. ex DC.) Greene
MUHL ASP	*Muhlenbergia asperifolia* (Nees & Meyen ex Trin.) Parodi
MUHL CUS	*Muhlenbergia cuspidata* (Torr. ex Hook.) Rydb.
MUHL GLO	*Muhlenbergia glomerata* (Willd.) Trin.
MUHL RAC	*Muhlenbergia racemosa* (Michx.) B.S.P.
MUHL RIC	*Muhlenbergia richardsonis* (Trin.) Rydb.
MONR SQU	*Monroa squarrosa* (Nutt.) Torr.
MUSI DIV	*Musineon divaricatum* (Pursh) Raf.
MYOS ALP	*Myosotis alpestris* F.W. Schmidt
MYOS ARI	*Myosurus aristatus* Benth.
MYOS ARV	*Myosotis arvensis* (L.) Hill
MYOS LAX	*Myosotis laxa* Lehm.
MYOS MIC	*Myosotis micrantha* auct. non Pallas ex Lehm.
MYOS MIN	*Myosurus minimus* L.
MYRI EXA	*Myriophyllum exalbescens* Fern.
MYRI VER	*Myriophyllum verticillatum* L.
NAJA FLE	*Najas flexilis* (Willd) Rostk. & Schmidt
NAST OFF	*Nasturtium officinale* Ait. f.
NAVA MIN	*Navarretia minima* Nutt.
NEMO BRE	*Nemophila breviflora* Gray
NEPE CAT	*Nepeta cataria* L.
NESL PAN	*Neslia paniculata* (L.) Desv.
NONE VES	*Nonea vesicaria* (L.) Reichenb.
NOTH CUS	*Nothocalais cuspidata* (Pursh) Greene
NUPH VAR	*Nuphar variegatum* Engelm.
NYMP TET	*Nymphaea tetragona* Georgi
ODON SER	*Odontites serotina* (Lam.)
OENO AND	*Oenothera andina* (Nutt.) Raven
OENO BIE	*Oenothera biennis* L.
OENO BRE	*Oenothera breviflora* Torr. & Gray
OENO CAE	*Oenothera caespitosa* Nutt.
OENO FLA	*Oenothera flava* (A. Nels.) Garrett
OENO NUT	*Oenothera nuttallii* Sweet
OENO SER	*Oenothera serrulata* Nutt.
ONOB VIC	*Onobrychis viciifolia* Scop.
ONON ARV	*Ononis arvensis* L.
ONOS MOL	*Onosmodium molle* Michx.
OPUN FRA	*Opuntia fragilis* (Nutt.) Haw.
OPUN POL	*Opuntia polyacantha* Haw.
ORCH ROT	*Orchis rotundifolia* Banks ex Pursh
ORCH SPP	*Orchis* spp.
OROB FAS	*Orobanche fasciculata* Nutt.
OROB LUD	*Orobanche ludoviciana* Nutt.
OROB UNI	*Orobanche uniflora* L.
ORTH LUT	*Orthocarpus luteus* Nutt.

Appendix 1C. Continued

FECD code	Scientific name
ORTH SEC	*Orthilia secunda* (L.) House
ORYZ ASP	*Oryzopsis asperifolia* Michx.
ORYZ CAN	*Oryzopsis canadensis* (Poir.) Torr.
ORYZ EXI	*Oryzopsis exigua* Thurb.
ORYZ HYM	*Oryzopsis hymenoides* (Roemer & J.A. Schultes) Richer ex Piper
ORYZ MIC	*Oryzopsis micrantha* (Trin. & Rupr.) Thurb.
ORYZ PUN	*Oryzopsis pungens* (Torr. ex Spreng.) A.S. Hitchc.
ORYZ SPP	*Oryzopsis* spp.
OSMO CHI	*Osmorhiza chilensis* Hook. & Arn.
OSMO DEP	*Osmorhiza depauperata* Phil.
OSMO LON	*Osmorhiza longistylis* (Torr.) DC.
OSMO OCC	*Osmorhiza occidentalis* (Nutt. ex Torr. & Gray) Torr.
OSMO PUR	*Osmorhiza purpurea* (Coult. & Rose) Suksdorf
OSMO SPP	*Osmorhiza* spp.
OXYC QUA	*Oxycoccus quadripetalus* Gilib.
OXYR DIG	*Oxyria digyna* (L.) Hill
OXYT CUS	*Oxytropis cusickii* Greenm.
OXYT DEF	*Oxytropis deflexa* (Pallas) DC.
OXYT JOR	*Oxytropis jordalii* Porsild
OXYT LAG	*Oxytropis lagopus* Nutt.
OXYT MON	*Oxytropis monticola* Gray
OXYT POD	*Oxytropis podocarpa* Gray
OXYT SER	*Oxytropis sericea* Nutt.
OXYT SPL	*Oxytropis splendens* Dougl. ex Hook.
OXYT SPP	*Oxytropis* spp.
OXYT VIS	*Oxytropis viscida* Nutt.
PANI CAP	*Panicum capillare* L.
PANI MIL	*Panicum miliaceum* L.
PAPA FRE	*Papaver freedmanianum* D. Löve
PAPA KLU	*Papaver kluanense* D. Löve
PAPA NUD	*Papaver nudicaule* L.
PAPA PYG	*Papaver pygmaeum* Rydb.
PAPA SOM	*Papaver somniferum* L.
PARI PEN	*Parietaria pensylvanica* Muhl. ex Willd.
PARN FIM	*Parnassia fimbriata* Koenig
PARN KOT	*Parnassia kotzebuei* Cham. ex Spreng.
PARN PAL	*Parnassia palustris* L.
PARN PAR	*Parnassia parviflora* DC.
PARN SPP	*Parnassia* spp.
PARO SES	*Paronychia sessiliflora* Nutt.
PAST SAT	*Pastinaca sativa* L.
PEDI ARC	*Pedicularis arctica* R. Br.
PEDI BRA	*Pedicularis bracteosa* Benth.
PEDI CAP	*Pedicularis capitata* M.F. Adams
PEDI CON	*Pedicularis contorta* Benth.
PEDI FLA	*Pedicularis flammea* L.
PEDI GRO	*Pedicularis groenlandica* Retz.
PEDI LAB	*Pedicularis labradorica* Wirsing
PEDI LAN	*Pedicularis lanata* Cham. & Schlecht.
PEDI PAR	*Pedicularis parviflora* Sm. ex Rees
PEDI RAC	*Pedicularis racemosa* Dougl. ex Benth.
PEDI SPP	*Pedicularis* spp.
PEDI SUD	*Pedicularis sudetica* Willd.
PELL ATR	*Pellaea atropurpurea* (L.) Link
PELL GLA	*Pellaea glabella* Mett. ex Kuhn.
PENS ALB	*Penstemon albertinus* Greene
PENS ALI	*Penstemon albidus* Nutt.
PENS CON	*Penstemon confertus* Dougl. ex Lindl.
PENS ELL	*Penstemon ellipticus* Coult. & Fischer
PENS ERI	*Penstemon eriantherus* Pursh
PENS GRA	*Penstemon gracilis* Nutt.
PENS LYA	*Penstemon lyallii* (Gray) Gray
PENS NIT	*Penstemon nitidus* Dougl. ex Benth.
PENS PRO	*Penstemon procerus* Dougl. ex Graham
PENS SPP	*Penstemon* spp.
PERI GAI	*Perideridia gairdneri* (Hook. & Arn.) Mathias
PETA CAN	*Petalostemon candidus* Michx.
PETA NIV	*Petasites nivalis* Greene
PETA PAL	*Petasites palmatus* (Ait.) Gray
PETA PUR	*Petalostemon purpureum* (Vent.) Rydb.
PETA SAG	*Petasites sagittatus* (Banks ex Pursh) Gray
PETA SPP	*Petalostemon* spp.
PETA VIT	*Petasites vitifolius* Greene
PHAC FRA	*Phacelia franklinii* (R.Br.) Greene
PHAC HAS	*Phacelia hastata* Dougl. ex Lehm.
PHAC LIN	*Phacelia linearis* (Pursh) Holz
PHAC LYA	*Phacelia lyallii* (Gray) Rydb.
PHAC SER	*Phacelia sericea* (Graham) Gray
PHAC SPP	*Phacelia* spp.
PHAL ARU	*Phalaris arundinacea* L.
PHAL CAN	*Phalaris canariensis* L.
PHEG CON	*Phegopteris connectilis* (Michx.) Watt.
PHLE COM	*Phleum commutatum* Gaudin
PHLE PRA	*Phleum pratense* L.
PHLO ALY	*Phlox alyssifolia* Greene
PHLO HOO	*Phlox hoodii* Richards.
PHRA AUS	*Phragmites australis* (Cav.) Trin. ex Steud.
PHYS DID	*Physaria didymocarpa* (Hook.) Gray
PHYS IXO	*Physalis ixocarpa* auct. non Brot. ex Hornem.
PHYS PAR	*Physostegia parviflora* Nutt. ex Gray
PICR ECH	*Picris echioides* L.
PING VIL	*Pinguicula villosa* L.
PING VUL	*Pinguicula vulgaris* L.
PLAG SCO	*Plagiobothrys scouleri* (Hook. & Arn.) I.M. Johnston
PLAN CAN	*Plantago canescens* M.F. Adams
PLAN ELO	*Plantago elongata* Pursh
PLAN ERI	*Plantago eriopoda* Torr.
PLAN MAJ	*Plantago major* L.
PLAN MAR	*Plantago maritima* L.
PLAN PAT	*Plantago patagonica* Jacq.
POA ALP	*Poa alpina* L.
POA ARC	*Poa arctica* R. Br.
POA ARI	*Poa arida* Vasey
POA CAN	*Poa canbyi* (Scribn.) T.J. Howell
POA COM	*Poa compressa* L.
POA CUS	*Poa cusickii* Vasey
POA EPI	*Poa epilis* Scribn.
POA GLA	*Poa glauca* Vahl
POA GRA	*Poa gracillima* Vasey
POA INT	*Poa interior* Rydb.
POA JUN	*Poa juncifolia* Scribn.
POA LEP	*Poa leptocoma* Trin.

Appendix 1C. Continued

FECD code	Scientific name
POA NER	*Poa nervosa* (Hook.) Vasey
POA NEV	*Poa nevadensis* Scribn.
POA PAL	*Poa palustris* L.
POA PAT	*Poa pattersonii* Vasey
POA PRA	*Poa pratensis* L.
POA SAN	*Poa sandbergii* Vasey
POA SPP	*Poa* spp.
POLA DOD	*Polanisia dodecandra* (L.) DC.
POLE ACU	*Polemonium acutiflorum* Willd. ex Roemer & J.A. Schultes
POLE PUL	*Polemonium pulcherrimum* Hook.
POLE SPP	*Polemonim* spp.
POLE VIS	*Polemonium viscosum* Nutt.
POLY AMP	*Polygonum amphibium* L.
POLY ARE	*Polygonum arenastrum* Jord. ex Boreau
POLY AUS	*Polygonum austiniae* Greene
POLY BIS	*Polygonum bistortoides* Pursh
POLY COC	*Polygonum coccineum* Muhl. ex Willd.
POLY CON	*Polygonum convolvulus* L.
POLY DOU	*Polygonum douglasii* Greene
POLY ENG	*Polygonum engelmannii* Greene
POLY ERE	*Polygonum erectum* L.
POLY HES	*Polypodium hesperium* Maxon
POLY LAP	*Polygonum lapathifolium* L.
POLY LON	*Polystichum lonchitis* (L.) Roth
POLY MIN	*Polygonum minimum* S. Wats.
POLY MON	*Polypogon monspeliensis* (L.) Desf.
POLY MOS	*Polygonum monspeliense* Pers.
POLY PAU	*Polygala paucifolia* Willd.
POLY PER	*Polygonum persicaria* L.
POLY RAM	*Polygonum ramosissimum* Michx.
POLY SCA	*Polygonum scandens* L.
POLY SEG	*Polygala senega* L.
POLY SPP	*Polygonum* spp.
POLY VIR	*Polypodium virginianum* L.
POLY VIV	*Polygonum viviparum* L.
POLY WAT	*Polygonum watsonii* Small
PORT OLE	*Portulaca oleracea* L.
POTA ALP	*Potamogeton alpinus* Balbis
POTA CRI	*Potamogeton crispus* L.
POTA FIL	*Potamogeton filiformis* Pers.
POTA FOL	*Potamogeton foliosus* Raf.
POTA FRI	*Potamogeton friesii* Rupr.
POTA GRA	*Potamogeton gramineus* L.
POTA NAT	*Potamogeton natans* L.
POTA OBT	*Potamogeton obtusifolius* Mert. & Koch.
POTA PEC	*Potamogeton pectinatus* L.
POTA PRA	*Potamogeton praelongus* Wulfen
POTA PUS	*Potamogeton pusillus* L.
POTA RIC	*Potamogeton richardsonii* (Benn.) Rydb.
POTA ROB	*Potamogeton robbinsii* Oakes
POTA STR	*Potamogeton strictifolius* Benn.
POTA VAG	*Potamogeton vaginatus* Turcz.
POTA ZOS	*Potamogeton zosteriformis* Fern.
POTE ANS	*Potentilla anserina* L.
POTE ARG	*Potentilla argentea* L.
POTE ARU	*Potentilla arguta* Pursh
POTE BIP	*Potentilla bipinnatifida* Dougl. ex Hook.
POTE CON	*Potentilla concinna* Richards.
POTE DIV	*Potentilla diversifolia* Lehm.
POTE DRU	*Potentilla drummondii* Lehm.
POTE FIN	*Potentilla finitima* Kohli & Packer
POTE GLA	*Potentilla glandulosa* Lindl.
POTE GRA	*Potentilla gracilis* Dougl. ex Hook.
POTE HIP	*Potentilla hippiana* Lehm.
POTE HOO	*Potentilla hookeriana* Lehm.
POTE HYP	*Potentilla hyparctica* Malte
POTE MUL	*Potentilla multifida* auct. non L.
POTE MUT	*Potentilla multisecta* (S. Wats.) Rydb.
POTE NIV	*Potentilla nivea* L.
POTE NOR	*Potentilla norvegica* L.
POTE OVI	*Potentilla ovina* Macoun ex J.M. Macoun
POTE PAL	*Potentilla palustris* (L.) Scop.
POTE PAR	*Potentilla paradoxa* Nutt.
POTE PEN	*Potentilla pensylvanica* L.
POTE PLA	*Potentilla plattensis* Nutt.
POTE REC	*Potentilla recta* L.
POTE RIV	*Potentilla rivalis* Nutt.
POTE SPP	*Potentilla* spp.
POTE TRI	*Potentilla tridentata* Ait.
POTE UNI	*Potentilla uniflora* Ledeb.
POTE VIL	*Potentilla villosa* Pallas ex Pursh
PREN ALA	*Prenanthes alata* (Hook.) D. Dietr.
PREN ARC	*Prenanthes racemosa* Michx.
PREN SAG	*Prenanthes sagittata* (Gray) A. Nels.
PRIM EGA	*Primula egaliksensis* Womsk. ex Hornem.
PRIM INC	*Primula incana* M.E. Jones
PRIM MIS	*Primula mistassinica* Michx.
PRIM SPP	*Primula* spp.
PRIM STR	*Primula stricta* Hornem.
PRUN VUL	*Prunella vulgaris* L.
PSIL ELA	*Psilocarphus elatior* (Gray) Gray
PSOR ARG	*Psoralea argophylla* Pursh
PSOR ESC	*Psoralea esculenta* Pursh
PSOR LAN	*Psoralea lanceolata* Pursh
PTER AND	*Pterospora andromedea* Nutt.
PTER AQU	*Pteridium aquilinum* (L.) Kuhn.
PUCC CUS	*Puccinellia cusickii* Weatherby
PUCC DIS	*Puccinellia distans* (Jacq.) Parl.
PUCC HAU	*Puccinellia hauptiana* (Trin. ex Krecz.) Kitagawa
PUCC NUT	*Puccinellia nuttalliana* (J.A. Schultes) A.S. Hitchc.
PUCC PAU	*Puccinellia pauciflora* (J. Presl) Munz
PYRO ASA	*Pyrola asarifolia* Michx.
PYRO BRA	*Pyrola bracteata* Hook.
PYRO CHL	*Pyrola chlorantha* Sw.
PYRO ELL	*Pyrola elliptica* Nutt.
PYRO GRA	*Pyrola grandiflora* Radius
PYRO MIN	*Pyrola minor* L.
PYRO PIC	*Pyrola picta* Sm.
PYRO SPP	*Pyrola* spp.
RANU ABO	*Ranunculus abortivus* L.
RANU ACR	*Ranunculus acris* L.
RANU AQU	*Ranunculus aquatilis* L.
RANU CAR	*Ranunculus cardiophyllus* Hook.
RANU CIR	*Ranunculus circinatus* auct. non Sibthorp.
RANU CYM	*Ranunculus cymbalaria* Pursh
RANU ESC	*Ranunculus eschscholtzii* Schlecht.
RANU GLA	*Ranunculus glaberrimus* Hook.
RANU GME	*Ranunculus gmelinii* DC.

Appendix 1C. Continued

FECD code	Scientific name
RANU GRA	*Ranunculus grayi* Britt.
RANU HYP	*Ranunculus hyperboreus* Rottb.
RANU INA	*Ranunculus inamoenus* Greene
RANU LAP	*Ranunculus lapponicus* L.
RANU MAC	*Ranunculus macounii* Britt.
RANU NIV	*Ranunculus nivalis* L.
RANU OCC	*Ranunculus occidentalis* Nutt.
RANU PED	*Ranunculus pedatifidus* Sm.
RANU PEN	*Ranunculus pensylvanicus* L. f.
RANU PYG	*Ranunculus pygmaeus* Wahlenb.
RANU REP	*Ranunculus repens* L.
RANU RET	*Ranunculus reptans* L.
RANU RHO	*Ranunculus rhomboideus* Goldie
RANU SCE	*Ranunculus sceleratus* L.
RANU SPP	*Ranunculus* spp.
RANU UNC	*Ranunculus uncinatus* D. Don ex G. Don
RANU VER	*Ranunculus verecundus* B.L. Robins. ex Piper
RAPH RAP	*Raphanus raphanistrum* L.
RATI COL	*Ratibida columnifera* (Nutt.) Woot. & Standl.
RHIN MIN	*Rhinanthus minor* L.
RHYN CAP	*Rhynchospora capillacea* Torr.
ROMA SIT	*Romanzoffia sitchensis* Bong.
RORI AUS	*Rorippa austriaca* (Crantz) Bess
RORI CUR	*Rorippa curvipes* Greene
RORI PAL	*Rorippa palustris* (L.) Bess.
RORI SIN	*Rorippa sinuata* (Nutt.) A.S. Hitchc.
RORI SYL	*Rorippa sylvestris* (L.) Bess.
RORI TEN	*Rorippa tenerrima* Greene
RORI TRU	*Rorippa truncata* (Jepson) R. Stuckey
RUBU ARC	*Rubus arcticus* L.
RUBU CHA	*Rubus chamaemorus* L.
RUBU PED	*Rubus pedatus* Sm.
RUBU PUB	*Rubus pubescens* Raf.
RUDB HIR	*Rudbeckia hirta* L.
RUME ACE	*Rumex acetosa* L.
RUME ACT	*Rumex acetosella* L.
RUME BRI	*Rumex britannica* Amer. auct. non L.
RUME CON	*Rumex confertus* Willd.
RUME CRI	*Rumex crispus* L.
RUME DEN	*Rumex dentatus* L.
RUME LON	*Rumex longifolius* DC.
RUME MAR	*Rumex maritimus* L.
RUME OCC	*Rumex occidentalis* S. Wats.
RUME PAU	*Rumex paucifolius* Nutt.
RUME PSE	*Rumex pseudonatronatus* Borbás
RUME SPP	*Rumex* spp.
RUME STE	*Rumex stenophyllus* Ledeb.
RUME TRI	*Rumex triangulivalvis* (Danser) Rech. f.
RUME VEN	*Rumex venosus* Pursh
RUPP MAR	*Ruppia maritima* L.
SAGI CUN	*Sagittaria cuneata* Sheldon
SAGI DEC	*Sagina decumbens* (Ell.) Torr. & Gray
SAGI LAT	*Sagittaria latifolia* Willd.
SAGI NIV	*Sagina nivalis* (Lindbl.) Fries
SAGI NOD	*Sagina nodosa* (L.) Fenzl
SAGI SAG	*Sagina saginoides* (L.) Karst.
SALI EUR	*Salicornia europaea* L.
SALS KAL	*Salsola kali* L.
SALV NEM	*Salvia nemorosa* L.
SANI MAR	*Sanicula marilandica* L.
SAPO OFF	*Saponaria officinalis* L.
SARR PUR	*Sarracenia purpurea* L.
SAUS AME	*Saussurea americana* D.C. Eaton
SAUS GLO	*Saussurea glomerata* DC.
SAUS NUD	*Saussurea nuda* Ledeb.
SAXI ADS	*Saxifraga adscendens* L.
SAXI AIZ	*Saxifraga aizoides* L.
SAXI BRO	*Saxifraga bronchialis* L.
SAXI CAE	*Saxifraga caespitosa* L.
SAXI CER	*Saxifraga cernua* L.
SAXI FER	*Saxifraga ferruginea* Graham
SAXI FLA	*Saxifraga flagellaris* Willd. ex Sternb.
SAXI HYP	*Saxifraga hyperborea* R. Br.
SAXI LYA	*Saxifraga lyallii* Engl.
SAXI MER	*Saxifraga mertensiana* Bong.
SAXI NEL	*Saxifraga nelsoniana* D. Don
SAXI NIV	*Saxifraga nivalis* L.
SAXI OCC	*Saxifraga occidentalis* S. Wats.
SAXI ODO	*Saxifraga odontoloma* Piper
SAXI OPP	*Saxifraga oppositifolia* L.
SAXI ORE	*Saxifraga oregana* T.J. Howell
SAXI SPP	*Saxifraga* spp.
SAXI TRI	*Saxifraga tricuspidata* Rottb.
SCHE PAL	*Scheuchzeria palustris* L.
SCHE PAN	*Schedonnardus paniculatus* (Nutt.) Trel.
SCHI PUR	*Schizachne purpurascens* (Torr.) Swallen
SCHI SCO	*Schizachyrium scoparium* (Michx.) Nash
SCHO LIN	*Schoenocrambe linifolia* (Nutt.) Greene
SCIR ACU	*Scirpus acutus* Muhl. ex Bigelow
SCIR CAE	*Scirpus caespitosus* L.
SCIR CLI	*Scirpus clintonii* Gray
SCIR CYP	*Scirpus cyperinus* (L.) Kunth
SCIR FLU	*Scirpus fluviatilis* (Torr.) Gray
SCIR HUD	*Scirpus hudsonianus* (Michx.) Fern.
SCIR MIC	*Scirpus microcarpus* J. & K. Presl.
SCIR NEV	*Scirpus nevadensis* S. Wats.
SCIR PAL	*Scirpus pallidus* (Britt.) Fern.
SCIR PAU	*Scirpus paludosus* A. Nels.
SCIR PUM	*Scirpus pumilus* Vahl
SCIR PUN	*Scirpus pungens* Vahl
SCIR SPP	*Scripus* spp.
SCIR VAL	*Scirpus validus* Vahl
SCLE ANN	*Scleranthus annuus* L.
SCOL FES	*Scolochloa festucacea* (Willd.) Link
SCRO LAN	*Scrophularia lanceolata* Pursh
SCUT GAL	*Scutellaria galericulata* L.
SECA CER	*Secale cereale* L.
SECA SPP	*Secale* spp.
SEDU DIV	*Sedum divergens* S. Wats.
SEDU LAN	*Sedum lanceolatum* Torr.
SEDU SPP	*Sedum* spp.
SEDU STE	*Sedum stenopetalum* Pursh
SELA DEN	*Selaginella densa* Rydb.
SELA RUP	*Selaginella rupestris* (L.) Spring
SELA SEL	*Selaginella selaginoides* (L.) Beauverd ex Mart. & Schrank
SELA SPP	*Selaginella* spp.
SELA WAL	*Selaginella wallacei* Hieron.
SENE CAN	*Senecio canus* Hook.
SENE COG	*Senecio congestus* (R. Br.) DC.
SENE CON	*Senecio conterminus* Greenm.

Appendix 1C. Continued

FECD code	Scientific name
SENE CYM	*Senecio cymbalarioides* Buek
SENE ERE	*Senecio eremophilus* Richards.
SENE FOE	*Senecio foetidus* J.T. Howell
SENE FRE	*Senecio fremontii* Torr. & Gray
SENE IND	*Senecio indecorus* Greene
SENE INT	*Senecio integerrimus* Nutt.
SENE LUG	*Senecio lugens* Richards.
SENE MAG	*Senecio megacephalus* Nutt.
SENE PAP	*Senecio pauperculus* Michx.
SENE PAU	*Senecio pauciflorus* Pursh
SENE PSE	*Senecio pseudaureus* Rydb.
SENE SPP	*Senecio* spp.
SENE STR	*Senecio streptanthifolius* Greene
SENE TRI	*Senecio triangularis* Hook.
SENE VIS	*Senecio viscosus* L.
SENE VUL	*Senecio vulgaris* L.
SETA GLA	*Setaria glauca* (L.) Beauverd
SETA VIR	*Setaria viridis* (L.) Beauverd
SILE ACA	*Silene acaulis* (L.) Jacq.
SILE ANT	*Silene antirrhina* L.
SILE CON	*Silene conoidea* L.
SILE CSE	*Silene csereii* Baumg.
SILE CUC	*Silene cucubalus* Wibel
SILE DRU	*Silene drummondii* Hook.
SILE FUR	*Silene furcata* Raf.
SILE MEN	*Silene menziesii* Hook.
SILE NOC	*Silene noctiflora* L.
SILE PAR	*Silene parryi* (S. Wats.) C.L. Hitchc. & Maguire
SILE PRA	*Silene pratensis* (Raf.) Godr. & Gren.
SILE SPP	*Silene* spp.
SILE URA	*Silene uralensis* (Rupr.) Bocquet
SILY MAR	*Silybum marianum* (L.) Gaertn.
SISY ALT	*Sisymbrium altissimum* L.
SISY LOE	*Sisymbrium loeselii* L.
SISY MON	*Sisyrinchium montanum* Greene
SISY OFF	*Sisymbrium officinale* (L.) Scop.
SISY SEP	*Sisyrinchium septentrionale* Bickn.
SITA HYS	*Sitanion hystrix* (Nutt.) J.G. Sm.
SIUM SUA	*Sium suave* Walt.
SMEL CAL	*Smelowskia calycina* (Steph. ex Willd.) C.A. Mey.
SMIL RAC	*Smilacina racemosa* (L.) Desf.
SMIL SPP	*Smilacina* spp.
SMIL STE	*Smilacina stellata* (L.) Desf.
SMIL TRI	*Smilacina trifolia* (L.) Desf.
SOLA NIG	*Solanum nigrum* L.
SOLA ROS	*Solanum rostratum* Dunal
SOLA SAR	*Solanum sarrachoides* auct. non Sendtner
SOLA TRI	*Solanum triflorum* Nutt.
SOLI CAN	*Solidago canadensis* L.
SOLI GIG	*Solidago gigantea* Ait.
SOLI GRA	*Solidago graminifolia* (L.) Salisb.
SOLI MIS	*Solidago missouriensis* Nutt.
SOLI MOL	*Solidago mollis* Bartl.
SOLI MUL	*Solidago multiradiata* Ait.
SOLI NEM	*Solidago nemoralis* Ait.
SOLI RIG	*Solidago rigida* L.
SOLI SPA	*Solidago spathulata* DC.
SOLI SPP	*Solidago* spp.
SONC ARV	*Sonchus arvensis* L.
SONC ASP	*Sonchus asper* (L.) Hill
SONC OLE	*Sonchus oleraceus* L.
SONC SPP	*Sonchus* spp.
SONC ULI	*Sonchus uliginosus* Bieb.
SPAR ANG	*Sparganium angustifolium* Michx.
SPAR EUR	*Sparganium eurycarpum* Engelm. ex Gray
SPAR FLU	*Sparganium fluctuans* (Morong) B.L. Robins.
SPAR GLO	*Sparganium glomeratum* (Laestad.) L. Neum.
SPAR GRA	*Spartina gracilis* Trin.
SPAR HYP	*Sparganium hyperboreum* Laestad.
SPAR MIN	*Sparganium minimum* (Hartman) Wallr.
SPAR PEC	*Spartina pectinata* Bosc ex Link
SPER ARV	*Spergula arvensis* L.
SPER DIA	*Spergularia diandra* (Guss.) Held. & Sart.
SPER MAR	*Spergularia marina* (L.) Griseb.
SPHE INT	*Sphenopholis intermedia* Rydb.) Rydb.
SPHE OBT	*Sphenopholis obtusata* (Michx.) Scribn.
SPIR POL	*Spirodela polyrhiza* (L.) Schleiden
SPIR ROM	*Spiranthes romanzoffiana* Cham.
SPOR CRY	*Sporobolus cryptandrus* (Torr.) Gray
SPOR NEG	*Sporobolus neglectus* Nash
STAC PAL	*Stachys palustris* L.
STEL AME	*Stellaria americana* (Porter ex B.L. Robins.) Standl.
STEL ARE	*Stellaria arenicola* Raup
STEL CAL	*Stellaria calycantha* (Ledeb.) Bong.
STEL CRA	*Stellaria crassifolia* Ehrh.
STEL CRI	*Stellaria crispa* Cham. & Schlecht
STEL LOG	*Stellaria longipes* Goldie
STEL LON	*Stellaria longifolia* Muhl. ex Willd.
STEL MED	*Stellaria media* (L.) Vill.
STEL OBT	*Stellaria obtusa* Engelm.
STEL SPP	*Stellaria* spp.
STEL UMB	*Stellaria umbellata* Turcz. ex Kar. & Kir.
STEN OCC	*Stenanthium occidentale* Gray
STEP RUN	*Stephanomeria runcinata* Nutt.
STIP COL	*Stipa columbiana* Macoun
STIP COM	*Stipa comata* Trin. & Rupr.
STIP CUR	*Stipa curtiseta* (A.S. Hitchc.) Barkworth
STIP RIC	*Stipa richardsonii* Link
STIP SPA	*Stipa spartea* Trin.
STIP VIR	*Stipa viridula* Trin.
STRE AMP	*Streptopus amplexifolius* (L.) DC.
STRE ROS	*Streptopus roseus* Michx.
STRE SPP	*Streptopus* spp.
STRE STR	*Streptopus streptopoides* (Ledeb.) Frye & Rigg
SUAE CAL	*Suaeda calceoliformis* (Hook.) Moq.
SUCK SUC	*Suckleya suckleyana* (Torr.) Rydb.
SUKS RAN	*Suksdorfia ranunculifolia* (Hook.) Engl.
SUKS VIO	*Suksdorfia violacea* Gray
SYMP OFF	*Symphytum officinale* L.
TANA HUR	*Tanacetum huronense* Nutt.
TANA VUL	*Tanacetum vulgare* L.
TARA CER	*Taraxacum ceratophorum* (Ledeb.) DC.
TARA LAE	*Taraxacum laevigatum* (Willd.) DC.
TARA OFF	*Taraxacum officinale* G.H. Weber ex Wiggers

Appendix 1C. Concluded

FECD code	Scientific name
TARA SPP	*Taraxacum* spp.
TELE HEU	*Telesonix heucheriformis* Rydb.
TELL GRA	*Tellima grandiflora* (Pursh) Dougl. ex Lindl.
THAL DAS	*Thalictrum dasycarpum* Fisch. & Avé Lall.
THAL OCC	*Thalictrum occidentale* Gray
THAL SPA	*Thalictrum sparsiflorum* Turcz. ex Fisch. & C.A. Mey.
THAL SPP	*Thalictrum* spp.
THAL VEN	*Thalictrum venulosum* Trel.
THEL MAR	*Thelesperma marginatum* Rydb.
THEL SAL	*Thellungiella salsuginea* (Pallas) O.E. Schulz
THER RHO	*Thermopsis rhombifolia* (Nutt. ex Pursh) Nutt. ex Richards.
THLA ARV	*Thlaspi arvense* L.
TIAR TRI	*Tiarella trifoliata* L.
TIAR UNI	*Tiarella unifoliata* L.
TOFI COC	*Tofieldia coccinea* Richards.
TOFI GLU	*Tofieldia glutinosa* (Michx.) Pers.
TOFI PUS	*Tofieldia pusilla* (Michx.) Pers.
TOFI SPP	*Tofieldia* spp.
TOLM INT	*Tolmachevia integrifolia* Raf.
TOWN CON	*Townsendia condensata* Parry ex Gray
TOWN EXS	*Townsendia exscapa* (Richards.) Porter
TOWN HOO	*Townsendia hookeri* Beaman
TOWN PAR	*Townsendia parryi* D.C. Eaton
TRAD OCC	*Tradescantia occidentalis* (Britt.) Smith
TRAG DUB	*Tragopogon dubius* Scop.
TRAG POR	*Tragopogon porrifolius* L.
TRAG PRA	*Tragopogon pratensis* L.
TRIE BOR	*Trientalis borealis* Raf.
TRIE EUR	*Trientalis europaea* L.
TRIF AUR	*Trifolium aureum* Pollich
TRIF HYB	*Trifolium hybridum* L.
TRIF PRA	*Trifolium pratense* L.
TRIF REP	*Trifolium repens* L.
TRIF SPP	*Trifolium* spp.
TRIG CAE	*Trigonella caerulea* (L.) Ser.
TRIG MAR	*Triglochin maritimum* L.
TRIG PAL	*Triglochin palustre* L.
TRIG SPP	*Triglochin* spp.
TRIL OVA	*Trillium ovatum* Pursh
TRIS CAN	*Trisetum canescens* Buckl.
TRIS CER	*Trisetum cernuum* Trin.
TRIS FLA	*Trisetum flavescens* (L.) Beauverd
TRIS MON	*Trisetum montanum* Vasey
TRIS SPI	*Trisetum spicatum* (L.) Richter
TRIS SPP	*Trisetum* spp.
TRIS WOL	*Trisetum wolfii* Vasey
TRIT AES	*Triticum aestivum* L.
TROL ALB	*Trollius albiflorus* (Gray) Rydb.
TYPH LAT	*Typha latifolia* L.
URTI DIO	*Urtica dioica* L.
URTI SPP	*Urticularia* spp.
URTI URE	*Urtica urens* L.
UTRI COR	*Utricularia cornuta* Michx.
UTRI INT	*Utricularia intermedia* Hayne
UTRI MIN	*Utricularia minor* L.
UTRI VUL	*Utricularia vulgaris* L.
VACC CAE	*Vaccinium caespitosum* Michx.
VACC PYR	*Vaccaria pyramidata* Medik.
VACC VIT	*Vaccinium vitis-idaea* L.
VAHL ATR	*Vahlodea atropurpurea* (Wahlenb.) Fries ex Hartman
VALE DIO	*Valeriana dioica* L.
VALE SIT	*Valeriana sitchensis* Bong.
VALE SPP	*Valeriana* spp.
VERA ESC	*Veratrum eschscholtzii* (J.A. & J.H. Schultes) Rydb. ex Heller
VERB BRA	*Verbena bracteata* Lag. & Rodr.
VERB NIG	*Verbascum nigrum* L.
VERB PHL	*Verbascum phlomoides* L.
VERB THA	*Verbascum thapsus* L.
VERO AGR	*Veronica agrestis* L.
VERO ALP	*Veronica alpina* L.
VERO AME	*Veronica americana* Schwein. ex Benth.
VERO CAT	*Veronica catenata* Pennell
VERO CHA	*Veronica chamaedrys* L.
VERO LON	*Veronica longifolia* L.
VERO PER	*Veronica peregrina* L.
VERO PES	*Veronica persica* Poir.
VERO SCU	*Veronica scutellata* L.
VERO SER	*Veronica serpyllifolia* L.
VERO SPP	*Veronica* spp.
VICI AME	*Vicia americana* Muhl. ex Willd.
VICI CRA	*Vicia cracca* L.
VICI SPP	*Vicia* spp.
VIOL ADU	*Viola adunca* Sm.
VIOL ARV	*Viola arvensis* Murr.
VIOL CAN	*Viola canadensis* L.
VIOL GLA	*Viola glabella* Nutt.
VIOL MAC	*Viola macloskeyi* Lloyd
VIOL NEP	*Viola nephrophylla* Greene
VIOL NUT	*Viola nuttallii* Pursh
VIOL ORB	*Viola orbiculata* Geyer ex Holz
VIOL PAL	*Viola palustris* L.
VIOL PED	*Viola pedatifida* G. Don
VIOL REN	*Viola renifolia* Gray
VIOL SEL	*Viola selkirkii* Pursh ex Goldie
VIOL SPP	*Viola* spp.
VIOL TRI	*Viola tricolor* L.
VULP OCT	*Vulpia octoflora* (Walt.) Rydb.
WOLF BOR	*Wolffia borealis* (Engelm. ex Hegelm.) Landolt ex Landolt & Willd.
WOLF COL	*Wolffia columbiana* Karst.
WOOD GLA	*Woodsia glabella* R. Br. ex Richards.
WOOD ILV	*Woodsia ilvensis* (L.) R. Br.
WOOD ORE	*Woodsia oregana* D.C. Eaton
WOOD SCO	*Woodsia scopulina* D.C. Eaton
XANT STR	*Xanthium strumarium* L.
XERO TEN	*Xerophyllum tenax* (Pursh) Nutt.
YUCC GLA	*Yucca glauca* Nutt.
ZANN PAL	*Zannichellia palustris* L.
ZIGA ELE	*Zigadenus elegans* Pursh
ZIGA SPP	*Zigadenus* spp.
ZIGA VEN	*Zigadenus venenosus* S. Wats.
ZIZA AQU	*Zizania aquatica* L.
ZIZI APT	*Zizia aptera* (Gray) Fern.

[a] Based on the Alberta plants and fungi — Master species list and species group checklists provided by the Resource Data Branch, Alberta Sustainable Resource Development, Government of Alberta.

Appendix 1D. Mosses[a]

FECD code	Scientific name
ABIE ABI	*Abietinella abietina* (Hedw.) Fleisch.
ALOI BRE	*Aloina brevirostris* (Hook. & Grev.) Kindb.
ALOI RIG	*Aloina rigida* (Hedw.) Limpr.
AMBL DEA	*Amblyodon dealbatus* (Hedw.) Bruch & Schimp. in B.S.G.
AMBL HUM	*Amblystegium humile* (P. Beauv.) Crundw.
AMBL NOT	*Amblystegium noterophilum* Sull. & Lesq. in Sull.) Holz.
AMBL RIP	*Amblystegium riparium* (Hedw.) Schimp. in B.S.G.
AMBL SER	*Amblystegium serpens* (Hedw.) Schimp. in B.S.G.
AMBL SPP	*Amblystegium* spp.
AMBL TEN	*Amblystegium tenax* (Hedw.) C. Jens.
AMBL VAR	*Amblystegium varium* (Hedw.) Lindb.
AMPH LAP	*Amphidium lapponicum* (Hedw.) Schimp.
AMPH MOU	*Amphidium mougeotii* (Bruch & Schimp. in B.S.G.) Schimp.
ANAS HEL	*Anastrophyllum helleranum* (Nees) R.M. Schust.
ANAS MIC	*Anastrophyllum michauxii* (F. Weber) H. Buch ex A. Evans
ANAS MIN	*Anastrophyllum minutum* (Schreb.) R.M. Schust.
ANDR NIV	*Andreaea nivalis* Hook.
ANDR RUP	*Andreaea rupestris* Hedw.
ANEU PIN	*Aneura pinguis* (L.) Dumort.
ANOE SEN	*Anoectangium sendtnerianum* Bruch & Schimp. in B.S.G.
ANOM MIN	*Anomodon minor* (Hedw.) Fürnr.
ANTH JUL	*Anthelia julacea* (L.) Dumort.
ANTH JUR	*Anthelia juratzkana* (Limpr.) Trevis.
ANTH PUN	*Anthoceros punctatus* L.
AONG LON	*Aongstroemia longipes* (Somm.) Bruch & Schimp. in B.S.G.
ARNE FEN	*Arnellia fennica* (Gottsche) Lindb.
ASTE LIN	*Asterella lindenbergiana* (Corda) Lindb.
ASTE SAC	*Asterella saccata* (Wahl.) A. Evans
ATHA HYA	*Athalamia hyalina* (Sommerf.) S. Hatt.
ATRI SEL	*Atrichum selwynii* Aust.
ATRI UND	*Atrichum undulatum* (Hedw.) P. Beauv.
AULA ACU	*Aulacomnium acuminatum* Lindb. & Arnell) Kindb.
AULA AND	*Aulacomnium androgynum* (Hedw.) Schwaegr.
AULA PAL	*Aulacomnium palustre* (Hedw.) Schwaegr.
AULA SPP	*Aulacomnium* spp.
AULA TUR	*Aulacomnium turgidum* (Wahleng.) Schwaegr.
BARB ACU	*Barbula acuta* (Brid.) Brid.
BARB ATT	*Barbilophozia attenuata* (Mart.) Loeske
BARB BAR	*Barbilophozia barbata* (Schmid. ex Schreb.) Loeske
BARB BIN	*Barbilophozia binsteadii* (Kaal.) Loeske
BARB CON	*Barbula convoluta* Hedw.
BARB FLO	*Barbilophozia floerke* (F. Weber & D. Mohr) Loeske
BARB HAT	*Barbilophozia hatcheri* (A. Evans) Loeske
BARB ICM	*Barbula icmadophila* Schimp. ex C. Mill.
BARB KUN	*Barbilophozia kunzeana* (Huebener) Gams
BARB LYC	*Barbilophozia lycopodioides* (Wallr.) Loeske
BARB QUA	*Barbilophozia quadriloba* (Lindb.) Loeske
BARB REF	*Barbula reflexa* (Brid.) Brid.
BARB SPP	*Barbula* spp.
BARB UNG	*Barbula unguiculata* Hedw.
BART HAL	*Bartramia halleriana* Hedw.
BART ITH	*Bartramia ithyphylla* Brid.
BART POM	*Bartramia pomiformis* Hedw.
BART SPP	*Bartramia* spp.
BAZZ TRI	*Bazzania tricrenata* (Wahlenb.) Lindb.
BLAS PUS	*Blasia pusilla* L.
BLEP SPP	*Blepharostoma* spp.
BLEP TRI	*Blepharostoma trichophyllum* (L.) Dumort.
BLIN ACU	*Blindia acuta* (Hedw.) Bruch & Schimp. in B.S.G.
BRAC ACU	*Brachythecium acutum* (Mitt.) Sull.
BRAC ALB	*Brachythecium albicans* (Hedw.) Schimp. in B.S.G.
BRAC CAM	*Brachythecium campestre* (C. Müll.) Schimp. in B.S.G.
BRAC COL	*Brachythecium collinum* (Schleich. ex C. Müll.) Schimp. in B.S.G.
BRAC CUR	*Brachythecium curtum* (Lindb.) Limpr.
BRAC FRI	*Brachythecium frigidum* (C. Müll.) Besch.
BRAC GRO	*Brachythecium groenlandicum* (C. Jens.) Schljak.
BRAC HYA	*Brachythecium hyalotapetum* B. Hig. & N. Hig.
BRAC LEI	*Brachythecium leibergii* Grout
BRAC MIL	*Brachythecium mildeanum* (Schimp.) Schimp. ex Milde
BRAC NEL	*Brachythecium nelsonii* Grout
BRAC OED	*Brachythecium oedipodium* (Mitt.) Jaeg.
BRAC PLU	*Brachythecium plumosum* (Hedw.) Schimp. in B.S.G.
BRAC POP	*Brachythecium populeum* (Hedw.) Schimp. in B.S.G.
BRAC REF	*Brachythecium reflexum* (Starke in Web. & Mohr) Schimp. in B.S.G.
BRAC RIV	*Brachythecium rivulare* Schimp. in B.S.G.
BRAC RUT	*Brachythecium rutabulum* (Hedw.) Schimp. in B.S.G.
BRAC SAL	*Brachythecium salebrosum* (Web. & Mohr) Schimp. in B.S.G.
BRAC SPP	*Brachythecium* spp.
BRAC STA	*Brachythecium starkei* (Brid.) Schimp. in B.S.G.
BRAC TUR	*Brachythecium turgidum* (Hartm.) Kindb.
BRAC VEL	*Brachythecium velutinum* (Hedw.) Schimp. in B.S.G.

Appendix 1D. Continued

FECD code	Scientific name
BRYO FER	*Bryoerythrophyllum ferruginascens* (Stirt.) Giac.
BRYO LON	*Bryobrittonia longipes* (Williams) Horton
BRYO REC	*Bryoerythrophyllum recurvirostre* (Hedw.) Chen
BRYU ALG	*Bryum algovicum* Sendtn. ex C. Müll.
BRYU ARC	*Bryum arcticum* (R. Br.) Bruch & Schimp. in B.S.G.
BRYU ARG	*Bryum argenteum* Hedw.
BRYU BIC	*Bryum bicolor* Dicks.
BRYU CAB	*Bryum calobryoides* Spence
BRYU CAE	*Bryum caespiticium* Hedw.
BRYU CAL	*Bryum calophyllum* R. Br.
BRYU CAP	*Bryum capillare* Hedw.
BRYU CYC	*Bryum cyclophyllum* (Schwaegr.) Bruch & Schimp. in B.S.G.
BRYU INT	*Bryum intermedium* auct. Eur. & Amer.
BRYU LIS	*Bryum lisae* De Not. var. *cuspidatum* (Bruch & Schipm. in B.S.G.) Marg.
BRYU LON	*Bryum lonchocaulon* C. Müll.
BRYU MAR	*Bryum marratii* Hook. f. & Wils. ex Wils.
BRYU MEE	*Bryum meesioides* Kindb. in Mac.
BRYU MUE	*Bryum muehlenbeckii* Bruch & Schimp. in B.S.G.
BRYU PAL	*Bryum pallens* (Brid.) Sw. in Röhl.
BRYU PAS	*Bryum pallescens* Schleich. ex Schwaegr.
BRYU PSE	*Bryum pseudotriquetrum* Besch
BRYU PUR	*Bryum purpurascens* (R. Br.) Bruch & Schimp. in B.S.G.
BRYU SCH	*Bryum schleicheri* Schwaegr.
BRYU SPP	*Bryum* spp.
BRYU STE	*Bryum stenotrichum* C. Müll.
BRYU STI	*Bryum stirtonii* Schimp.
BRYU TUR	*Bryum turbinatum* (Hedw.) Turn.
BRYU ULI	*Bryum uliginosum* (Brid.) Bruch & Schimp. in B.S.G.
BRYU WEI	*Bryum weigelii* Spreng. in Biehler
BUCE ROM	*Bucegia romanica* Radian
BUXB APH	*Buxbaumia aphylla* Hedw.
BUXB VIR	*Buxbaumia viridis* (DC.) Moug. & Nestl.
CALL COR	*Calliergon cordifolium* (Hedw.) Kindb.
CALL CUS	*Calliergonella cuspidata* (Hedw.) Loeske
CALL GIG	*Calliergon giganteum* (Schimp.) Kindb.
CALL RIC	*Calliergon richardsonii* (Mitt.) Kindb. in Warnst.
CALL SAR	*Calliergon sarmentosum* Wahlenb.) Kindb.
CALL SPP	*Calliergon* spp.
CALL STR	*Calliergon stramineum* (Brid.) Kindb.
CALL TRI	*Calliergon trifarium* (Web. & Mohr) Kindb.
CALY INT	*Calypogeia integristipula* Steph.
CALY MUE	*Calypogeia muelleriana* (Schiffn.) Müll. Frib.
CALY NEE	*Calypogeia neesiana* (C. Massal .& Carestia) Müll. Frib.
CALY SPH	*Calypogeia sphagnicola* (Arnell & J. Perss.) Warnst. & Loeske
CALY SUE	*Calypogeia suecica* (Arnell & J. Perss.) Müll. Frib.
CALY TRI	*Calypogeia trichomanis* (L.) Corda
CAMP CHR	*Campylium chrysophyllum* (Brid.) J. Lange
CAMP HAL	*Campylium halleri* (Hedw.) Lindb.
CAMP HIS	*Campylium hispidulum* (Brid.) Mitt.
CAMP POL	*Campylium polygamum* (Schimp. in B.S.G.) C. Jens.
CAMP RAD	*Campylium radicale* (P. Beauv.) Grout
CAMP SPP	*Campylium* spp.
CAMP STE	*Campylium stellatum* (Hedw.) C. Jens
CATO NIG	*Catoscopium nigritum* (Hedw.) Brid.
CEPH BIC	*Cephalozia bicuspidata* (L.) Dumort.
CEPH CAT	*Cephalozia catenulata* Huebener) Lindb.
CEPH CON	*Cephalozia connivens* (Dicks.) Lindb.
CEPH DIV	*Cephaloziella divaricata* (Sm.) Schiffn.
CEPH ELA	*Cephaloziella elachista* (J.B. Jack) Schiffn.
CEPH HAM	*Cephaloziella hampeana* (Nees) Schiffn.
CEPH LUN	*Cephalozia lunulifolia* (Dumort.) Dumort
CEPH MAC	*Cephalozia macounii* (Austin) Austin
CEPH PLE	*Cephalozia pleniceps* (Austin) Lindb.
CEPH RUB	*Cephaloziella rubella* (Nees) Warnst.
CERA PUR	*Ceratodon purpureus* (Hedw.) Brid.
CHAN SET	*Chandonanthus setiformis* (Ehrh.) Lindb.[b]
CHIL PAL	*Chiloscyphus pallescens* (Ehrh. ex Hoffm.) Dumort.
CHIL POL	*Chiloscyphus polyanthos* (L.) Corda
CINC STY	*Cinclidium stygium* Sw. in Schrad.
CIRR CIR	*Cirriphyllum cirrosum* (Schwaegr. in Schultes) Grout
CLAD FLU	*Cladopodiella fluitans* (Nees) H. Buch
CLAO BOL	*Claopodium bolanderi* Best
CLIM DEN	*Climacium dendroides* (Hedw.) Web. & Mohr
CNES ALP	*Cnestrum alpestre* (Wahlenb.) Milde
CNES GLA	*Cnestrum glaucescens* (Lindb. & Arnell) Par.
CNES SCH	*Cnestrum schisti* (Web. & Mohr) Lindb.
CONA COM	*Conardia compacta* (C. Müll.) Robins.
CONO CON	*Conocephalum conicum* (L.) Dumort.
CONO TET	*Conostomum tetragonum* (Hedw.) Lindb.
COSC CAL	*Coscinodon calyptratus* (Hook. in Drumm.) C. Jens. ex Kindb.
CRAT COM	*Cratoneuron commutatum* (Brid.) G. Roth
CRAT FIL	*Cratoneuron filicinum* (Hedw.) Spruce
CRAT WIL	*Cratoneuron williamsii* Grout
CYNO SPP	*Cynodontium* spp.
CYNO STR	*Cynodontium strumiferum* (Hedw.) Lindb.
CYNO TEN	*Cynodontium tenellum* (Bruch & Schimp. in B.S.G.) Limpr.
CYRT HYM	*Cyrtomnium hymenophylloides* (Hüb.) Nyh. ex T. Kop.
DESM CER	*Desmatodon cernuus* (Hüb.) Bruch & Schimp. in B.S.G.

Appendix 1D. Continued

FECD code	Scientific name
DESM GUE	*Desmatodon guepinii* Bruch & Schimp. in B.S.G.
DESM HEI	*Desmatodon heimii* (Hedw.) Mitt.
DESM LAT	*Desmatodon latifolius* (Hedw.) Brid.
DESM LAU	*Desmatodon laureri* (Schultz) Bruch & Schimp. in B.S.G.
DESM LEU	*Desmatodon leucostoma* (R. Br.) Berggr.
DESM OBT	*Desmatodon obtusifolius* (Schwaegr.) Schimp.
DESM RAN	*Desmatodon randii* (Kenn.) Laz.
DESM SPP	*Desmatodon* spp.
DESM SYS	*Desmatodon systylius* Schimp.
DICH FAL	*Dichelyma falcatum* (Hedw.) Myr.
DICH OLY	*Dichodontium olympicum* Ren. & Card.
DICH PEL	*Dichodontium pellucidum* (Hedw.) Schimp.
DICR ACU	*Dicranum acutifolium* (Lindb. & Arnell) C. Jens. ex Weinm.
DICR ANG	*Dicranum angustum* Lindb.
DICR BON	*Dicranum bonjeanii* De Not. in Lisa
DICR BRE	*Dicranum brevifolium* (Lindb.) Lindb.
DICR CER	*Dicranella cerviculata* (Hedw.) Schimp.
DICR CRI	*Dicranella crispa* (Hedw.) Schimp.
DICR CRS	*Dicranoweisia crispula* (Hedw.) Lindb. ex Milde
DICR ELO	*Dicranum elongatum* Schleich. ex Schwaegr.
DICR FLA	*Dicranum flagellare* Hedw.
DICR FRA	*Dicranum fragilifolium* Lindb.
DICR FUS	*Dicranum fuscescens* Turn.
DICR GRE	*Dicranella grevilleana* (Brid.) Schimp.
DICR GRO	*Dicranum groenlandicum* Brid.
DICR HET	*Dicranella heteromalla* (Hedw.) Schimp.
DICR HOW	*Dicranum howellii* Ren. & Card.
DICR MAJ	*Dicranum majus* Sm.
DICR MON	*Dicranum montanum* Hedw.
DICR MUE	*Dicranum muehlenbeckii* Bruch & Schimp. in B.S.G.
DICR ONT	*Dicranum ontariense* Peters.
DICR PAL	*Dicranum pallidisetum* (Bail.) in Holz.) Irel.
DICR PAU	*Dicranella palustris* (Dicks.) Crundw. ex Warb.
DICR POL	*Dicranum polysetum* Sw.
DICR RUF	*Dicranella rufescens* (With.) Schimp.
DICR SCH	*Dicranella schreberiana* (Hedw.) Hilf. ex Crum & Anderson
DICR SCO	*Dicranum scoparium* Hedw.
DICR SPA	*Dicranum spadiceum* Zett.
DICR SPP	*Dicranum* spp.
DICR SUB	*Dicranella subulata* (Hedw.) Schimp.
DICR TAU	*Dicranum tauricum* Sapeh.
DICR UND	*Dicranum undulatum* Brid.
DICR VAR	*Dicranella varia* (Hedw.) Schimp.
DIDY ACU	*Didymodon acutus* (Brid.) Saito
DIDY ASP	*Didymodon asperifolius* (Mitt.) Crum et al.
DIDY FAL	*Didymodon fallax* (Hedw.) Zand.
DIDY JOH	*Didymodon johansenii* (Williams) Crum
DIDY NIG	*Didymodon nigrescens* (Mitt.) Saito
DIDY RIG	*Didymodon rigidulus* Hedw.
DIDY SUB	*Didymodon subandreaeoides* (Kindb.) Zand.
DIDY TOP	*Didymodon tophaceus* (Brid.) Lisa
DIPL ALB	*Diplophyllum albicans* (L.) Dumort.
DIPL TAX	*Diplophyllum taxifolium* (Wahlenb.) Dumort.
DISC NUD	*Discelium nudum* (Dicks.) Brid.
DIST CAP	*Distichium capillaceum* (Hedw.) Bruch & Schimp. in B.S.G.
DIST INC	*Distichium inclinatum* (Hedw.) Bruch & Schimp. in B.S.G.
DIST SPP	*Distchium* spp.
DITR CRI	*Ditrichum crispatissimum* (C. Müll.) Par.
DITR FLE	*Ditrichum flexicaule* (Schwaegr.) Hampe
DITR LIN	*Ditrichum lineare* (Sw.) Lindb.
DITR MON	*Ditrichum montanum* Leib.
DITR SPP	*Ditrichum* spp.
DREP ADU	*Drepanocladus aduncus* (Hedw.) Warnst.
DREP CAP	*Drepanocladus capillifolius* (Warnst.) Warnst.
DREP CRA	*Drepanocladus crassicostatus* Janssens
DREP EXA	*Drepanocladus exannulatus* (Schimp. in B.S.G.) Warnst.
DREP FLU	*Drepanocladus fluitans* (Hedw.) Warnst.
DREP LAP	*Drepanocladus lapponicus* (Norrl.) Smirn.
DREP LYC	*Drepanocladus lycopodioides* (Brid.) Warnst.
DREP PSE	*Drepanocladus pseudostramineus* (C. Müll.) G. Roth
DREP REV	*Drepanocladus revolvens* (Sw.) Warnst.
DREP SEN	*Drepanocladus sendtneri* (Schimp.) Warnst.
DREP SPP	*Drepanocladus* spp.
DREP TUN	*Drepanocladus tundrae* (Arnell) Loeske
DREP UNC	*Drepanocladus uncinatus* (Hedw.) Warnst.
DREP VER	*Drepanocladus vernicosus* (Mitt.) Warnst.
DRYP PAT	*Dryptodon patens* (Hedw.) Brid.
ENCA AFF	*Encalypta affinis* Hedw. f. in Web. & Mohr
ENCA ALP	*Encalypta alpina* Sm.
ENCA BRC	*Encalypta brevicolla* (Bruch & Schimp. in B.S.G.) Bruch ex Ångstr.
ENCA BRE	*Encalypta brevipes* Schljak.
ENCA CIL	*Encalypta ciliata* Hedw.
ENCA INT	*Encalypta intermedia* Jur. in Jur. & Milde
ENCA LON	*Encalypta longicolla* Bruch
ENCA MUT	*Encalypta mutica* Hag.
ENCA PRO	*Encalypta procera* Bruch
ENCA RHA	*Encalypta rhaptocarpa* Schwaegr.
ENCA SPA	*Encalypta spathulata* C. Müll.
ENCA SPP	*Encalypta* spp.
ENCA VUL	*Encalypta vulgaris* Hedw.
ENTO BRE	*Entodon brevisetus* (Hook. & Wils. in Wils.) Lindb.

Appendix 1D. Continued

FECD code	Scientific name
ENTO CLA	*Entodon cladorrhizans* (Hedw.) C. Müll.
ENTO CON	*Entodon concinnus* (De Not.) Par.
ENTO SCH	*Entodon schleicheri* (Schimp.) Demeter
EURH PUL	*Eurhynchium pulchellum* (Hedw.) Jenn.
FISS ADI	*Fissidens adianthoides* Hedw.
FISS BRY	*Fissidens bryoides* Hedw.
FISS GRA	*Fissidens grandifrons* Brid.
FISS LIM	*Fissidens limbatus* Sull.
FISS OSM	*Fissidens osmundioides* Hedw.
FONT ANT	*Fontinalis antipyretica* Hedw.
FONT DAL	*Fontinalis dalecarlica* Schimp. in B.S.G.
FONT HOW	*Fontinalis howellii* Ren. & Card.
FONT HYP	*Fontinalis hypnoides* Hartm.
FONT NEO	*Fontinalis neomexicana* Sull. & Lesq.
FONT NOV	*Fontinalis novae-angliae* Sull.
FOSS MAC	*Fossombronia macounii* Austin
FRUL INF	*Frullania inflata* Gottsche
FUNA AME	*Funaria americana* Lindb. in Sull.
FUNA HYG	*Funaria hygrometrica* Hedw.
FUNA MUH	*Funaria muhlenbergii* Turn.
GEOC GRA	*Geocalyx graveolens* (Schrad.) Nees
GRIM AFF	*Grimmia affinis* Hoppe & Hornsch. ex Hornsch.
GRIM ANO	*Grimmia anodon* Bruch & Schimp. in B.S.G.
GRIM APO	*Grimmia apocarpa* Hedw.
GRIM ATR	*Grimmia atrichia* C. Müll. & Kindb.
GRIM CAL	*Grimmia calyptrata* Hook. in Drumm.
GRIM CRI	*Grimmia cribosa* Hedw.
GRIM DON	*Grimmia donniana* Sm.
GRIM ELA	*Grimmia elatior* Bruch ex Bals. & De Not.
GRIM ELO	*Grimmia elongata* Kaulf. in Sturm
GRIM HET	*Grimmia heterophylla* Kindb. in Mac. and Kindb.
GRIM INC	*Grimmia incurva* Schwaegr.
GRIM MON	*Grimmia montana* Bruch & Schimp. in B.S.G.
GRIM PIL	*Grimmia pilifera* P. Beauv.
GRIM PLA	*Grimmia plagiopodia* Hedw.
GRIM PUL	*Grimmia pulvinata* (Hedw.) Sm.
GRIM SPP	*Grimmia* spp.
GRIM TER	*Grimmia tenerrima* Ren. & Card.
GRIM TOR	*Grimmia torquata* Hornsch. in Grev.
GRIM TRI	*Grimmia trichophylla* Grev.
GYMN AER	*Gymnostomum aeruginosum* Sm.
GYMN CON	*Gymnomitrion concinnatum* (Lightf.) Corda
GYMN COR	*Gymnomitrion corallioides* Nees
GYMN INF	*Gymnocolea inflata* (Huds.) Dumort.
GYMN REC	*Gymnostomum recurvirostre* Hedw.
HAPL MIC	*Haplocladium microphyllum* (Hedw.) Broth.
HAPL VIR	*Haplocladium virginianum* (Brid.) Broth
HARP FLO	*Harpanthus flotovianus* (Nees) Nees
HEDW CIL	*Hedwigia ciliata* (Hedw.) P. Beauv.
HELO BLA	*Helodium blandowii* (Web. & Mohr) Warnst.
HERZ SEL	*Herzogiella seligeri* (Brid.) Iwats.
HERZ STR	*Herzogiella striatella* (Brid.) Iwats.
HERZ TUR	*Herzogiella turfacea* (Lindb.) Iwats.
HETE DIM	*Heterocladium dimorphum* (Brid.) Schimp. in B.S.G.
HOMA AEN	*Homalothecium aeneum* (Mitt.) Lawt.
HOMA NEV	*Homalothecium nevadense* (Lesq.) Ren. & Card.
HOMA PIN	*Homalothecium pinnatifidum* (Sull. & Lesq.) Lawt.
HOMO ADN	*Homomallium adnatum* (Hedw.) Broth.
HYGR ALP	*Hygrohypnum alpestre* (Hedw.) Loeske
HYGR BES	*Hygrohypnum bestii* (Ren. & Bryhn in Ren.) Broth.
HYGR DUR	*Hygrohypnum duriusculum* (De Not.) Jamieson
HYGR LAX	*Hygrobiella laxifolia* (Hook.) Spruce
HYGR LUR	*Hygrohypnum luridum* (Hedw.) Jenn.
HYGR MOL	*Hygrohypnum molle* (Hedw.) Loeske
HYGR OCH	*Hygrohypnum ochraceum* (Turn. ex Wils.) Loeske
HYGR SMI	*Hygrohypnum smithii* (Sw. in Lilj.) Broth.
HYGR STY	*Hygrohypnum styriacum* (Limpr.) Broth.
HYLO PYR	*Hylocomium pyrenaicum* (Spruce) Lindb.
HYLO SPL	*Hylocomium splendens* (Hedw.) Schimp. in B.S.G.
HYLO SPP	*Hylocomium* spp.
HYPN BAM	*Hypnum bambergeri* Schimp.
HYPN CAL	*Hypnum callichroum* Funck ex Brid.
HYPN CUP	*Hypnum cupressiforme* Hedw.
HYPN LIN	*Hypnum lindbergii* Mitt.
HYPN PAL	*Hypnum pallescens* (Hedw.) P. Beauv.
HYPN PRA	*Hypnum pratense* (Rabenh.) W. Koch ex Spruce
HYPN PRO	*Hypnum procerrimum* Mol.
HYPN REC	*Hypnum recurvatum* (Lindl. & Arnell) Kindb.
HYPN REV	*Hypnum revolutum* (Mitt.) Lindb.
HYPN SPP	*Hypnum* spp.
HYPN VAU	*Hypnum vaucheri* Lesq.
ISOP PUL	*Isopterygium pulchellum* (Hedw.) Jaeg.
JAFF RAU	*Jaffueliobryum raui* (Aust.) Thér.
JAFF WRI	*Jaffueliobryum wrightii* (Sull. in Gray) Thér.
JAME AUT	*Jamesoniella autumnalis* (DC.) Steph.
JUNG ATR	*Jungermannia atrovirens* Dumort.
JUNG EXS	*Jungermannia exsertifolia* Steph.
JUNG HYA	*Jungermannia hyalina* Lyell
JUNG LEI	*Jungermannia leiantha* Grolle
JUNG OBO	*Jungermannia obovata* Nees
JUNG POL	*Jungermannia polaris* Lindb.
JUNG PUM	*Jungermannia pumila* With.
JUNG RUB	*Jungermannia rubra* Gottsche ex Underw.
JUNG SPH	*Jungermannia sphaerocarpa* Hook.
KIAE BLY	*Kiaeria blyttii* (Schimp.) Broth.
KIAE FAL	*Kiaeria falcata* (Hedw.) Hag.
KIAE STA	*Kiaeria starkei* (Web. & Mohr) Hag.
LEPI REP	*Lepidozia reptans* (L.) Dumort.
LEPT PYF	*Leptobryum pyriforme* (Hedw.) Wils.
LESC INC	*Lescuraea incurvata* (Hedw.) Lawt.

Appendix 1D. Continued

FECD code	Scientific name
LESC PAT	*Lescuraea patens* (Lindb.) Kindb.
LESC RAD	*Lescuraea radicosa* (Mitt.) M"nk
LESC SAX	*Lescuraea saxicola* (Schimp. in B.S.G.) Milde
LESC SPP	*Lescuraea* spp.
LESC STE	*Lescuraea stenophylla* (Ren. & Card.) in Röll
LESK NER	*Leskeella nervosa* (Brid.) Loeske
LESK OBS	*Leskea obscura* Hedw.
LOES BAD	*Loeskypnum badium* (Hartm.) Paul
LOPH ALP	*Lophozia alpestris* (Schleich. ex Weber) A. Evans
LOPH ASC	*Lophozia ascendens* (Warnst.) R.M. Schust.
LOPH BAD	*Lophozia badensis* (Gottsche ex Rabenh.) Schiffn.
LOPH BAN	*Lophozia bantriensis* (Hook.) Steph.
LOPH BID	*Lophocolea bidentata* (L.) Dumort.
LOPH COL	*Lophozia collaris* (Nees) Dumort.
LOPH EXC	*Lophozia excisa* (Dicks.) Dumort.
LOPH GIL	*Lophozia gillmanii* (Austin) R.M. Schust.
LOPH GRA	*Lophozia grandiretis* (Lindb. ex Kaal.) Schiffn.
LOPH GUT	*Lophozia guttulata* (Lindb. & Arnell) A. Evans
LOPH HET	*Lophozia heterocolpos* (Thed. ex Hartm.) M. Howe
LOPH HEY	*Lophocolea heterophylla* (Schrad.) Dumort.
LOPH INC	*Lophozia incisa* (Schrad.) Dumort.
LOPH LAX	*Lophozia laxa* (Lindb.) Grolle
LOPH LON	*Lophozia longidens* (Lindb.) Macoun
LOPH MIN	*Lophocolea minor* Nees
LOPH OBT	*Lophozia obtusa* (Lindb.) A. Evans
LOPH RUT	*Lophozia rutheana* (Limpr.) M. Howe
LOPH SPP	*Lophozia* spp.
LOPH VEN	*Lophozia ventricosa* (Dicks.) Dumort.
LOPH WEN	*Lophozia wenzelii* (Nees) Steph.
MANN FRA	*Mannia fragrans* (Balb.) Frye & L. Clark
MANN PIL	*Mannia pilosa* (Hornem.) Frye & L. Clark
MANN TRI	*Mannia triandra* (Scop.) Grolle
MARC POL	*Marchantia polymorpha* L.
MARC SPP	*Marchantia* spp.
MARS BRE	*Marsupella brevissima* (Dumort.) Grolle
MARS EMA	*Marsupella emarginata* (Ehrh.) Dumort.
MARS REV	*Marsupella revoluta* (Nees) Dumort.
MARS SPA	*Marsupella sparsifolia* (Lindb.) Dumort.
MARS SPH	*Marsupella sphacelata* (Gieseke) Dumort.
MEES LON	*Meesia longiseta* Hedw.
MEES TRI	*Meesia triquetra* (Richt.) Ångstr.
MEES ULI	*Meesia uliginosa* Hedw.
META MEN	*Metaneckera menziesii* (Hook. in Drumm.) Steere
MIEL MAC	*Mielichhoferia macrocarpa* (Hook. in Drumm.) Bruch & Schimp. ex Jaeg.
MNIU AMB	*Mnium ambiguum* H. Müll.
MNIU ARI	*Mnium arizonicum* Amann
MNIU BLY	*Mnium blyttii* Bruch & Schimp. in B.S.G.
MNIU LYC	*Mnium lycopodioides* Schwaegr.
MNIU MAR	*Mnium marginatum* (With.) Brid. ex P. Beauv.
MNIU SPI	*Mnium spinulosum* Bruch & Schimp. in B.S.G.
MNIU SPP	*Mnium* spp.
MNIU THO	*Mnium thomsonii* Schimp.
MOER BLY	*Moerckia blyttii* (Moerch) Brockm.
MOER HIB	*Moerckia hibernica* (Hook.) Gottsche
MYLI ANO	*Mylia anomala* (Hook.) Gray
MYUR JUL	*Myurella julacea* (Schwaegr.) Schimp. in B.S.G.
MYUR SIB	*Myurella sibirica* (C. Müll.) Reim.
MYUR TEN	*Myurella tenerrima* (Brid.) Lindb.
NARD BRE	*Nardia breidleri* (Limpr.) Lindb.
NARD GEO	*Nardia geoscyphus* (De Not.) Lindb.
NECK PEN	*Neckera pennata* Hedw.
ODON DEN	*Odontoschisma denudatum* (Mart.) Dumort.
OLIG ALI	*Oligotrichum aligerum* Mitt.
OLIG HER	*Oligotrichum hercynicum* (Hedw.) Lam. & DC.
OLIG PAR	*Oligotrichum parallelum* (Mitt.) Kindb.
ONCO VIR	*Oncophorus virens* (Hedw.) Brid.
ONCO WAH	*Oncophorus wahlenbergii* Brid.
OREA MAR	*Oreas martiana* (Hoppe & Hornsch. in Hornsch.) Brid.
ORTH AFF	*Orthotrichum affine* Brid.
ORTH ALP	*Orthotrichum alpestre* Hornsch. in B.S.G.
ORTH ANO	*Orthotrichum anomalum* Hedw.
ORTH CHR	*Orthothecium chryseum* (Schwaegr. in Schultes) Schimp. in B.S.G.
ORTH INT	*Orthothecium intricatum* (Hartm.) Schimp. in B.S.G.
ORTH JAM	*Orthotrichum jamesianum* Sull. in James in Watson
ORTH LAE	*Orthotrichum laevigatum* Zett.
ORTH OBT	*Orthotrichum obtusifolium* Brid.
ORTH PAL	*Orthotrichum pallens* Bruch ex Brid.
ORTH PEL	*Orthotrichum pellucidum* Lindb.
ORTH PUL	*Orthotrichum pulchellum* Brunt. in Winch. & Gateh.
ORTH PUM	*Orthotrichum pumilum* Sw.
ORTH PYL	*Orthotrichum pylaisii* Brid.
ORTH RUP	*Orthotrichum rupestre* Schleich. ex Schwaegr.
ORTH SPE	*Orthotrichum speciosum* Nees in Sturm
ORTH SPP	*Orthotrichum* spp.
ORTH STR	*Orthothecium strictum* Lor.
OXYS TEN	*Oxystegus tenuirostris* (Hook. & Tayl.) A.J.E. Sm.
PALU SQU	*Paludella squarrosa* (Hedw.) Brid.
PARA ENE	*Paraleucobryum enerve* (Thed. in Hartm.) Loeske
PARA LON	*Paraleucobryum longifolium* (Hedw.) Loeske
PELL END	*Pellia endiviifolia* (Dicks.) Dumort.
PELL EPI	*Pellia epiphylla* (L.) Corda

Appendix 1D. Continued

FECD code	Scientific name
PELL NEE	*Pellia neesiana* (Gottsche) Limpr.
PHAS CUS	*Phascum cuspidatum* Hedw.
PHIL FON	*Philonotis fontana* (Hedw.) Brid.
PHIL MAR	*Philonotis marchica* (Hedw.) Brid.
PHYS HOO	*Physcomitrium hookeri* Hampe
PHYS PYR	*Physcomitrium pyriforme* (Hedw.) Hampe
PLAG ASP	*Plagiochila asplenioides* (L.) Dumort.
PLAG CIL	*Plagiomnium ciliare* (C. Müll.) T. Kop.
PLAG CUS	*Plagiomnium cuspidatum* (Hedw.) T. Kop.
PLAG DEM	*Plagiobryum demissum* (Hook.) Lindb.
PLAG DEN	*Plagiothecium denticulatum* (Hedw.) Schimp. in B.S.G.
PLAG DRU	*Plagiomnium drummondii* (Bruch & Schimp.) T. Kop.
PLAG ELL	*Plagiomnium ellipticum* (Brid.) T. Kop.
PLAG LAE	*Plagiothecium laetum* Schimp. in B.S.G.
PLAG MED	*Plagiomnium medium* (Bruch & Schimp. in B.S.G.) T. Kop.
PLAG OED	*Plagiopus oederiana* (Sw.) Crum & Anderson
PLAG POR	*Plagiochila porelloides* (Torr. ex Nees) Lindenb.
PLAG RUG	*Plagiomnium rugicum* (Laur.) T. Kop.
PLAG SPP	*Plagiomnium* spp.
PLAG UND	*Plagiothecium undulatum* (Hedw.) Schimp. in B.S.G.
PLAG ZIE	*Plagiobryum zieri* (Hedw.) Lindb.
PLAT JUN	*Platydictya jungermannioides* (Brid.) Crum
PLAT MIN	*Platydictya minutissima* (Sull. & Lesq. in Sull.) Crum
PLAT REP	*Platygyrium repens* (Brid.) Schimp. in B.S.G.
PLAT SPP	*Platydictya* spp.
PLEU ALB	*Pleurocladula albescens* (Hook.) Grolle
PLEU SCH	*Pleurozium schreberi* (Brid.) Mitt.
PLEU SPP	*Pleurozium* spp.
POGO DEN	*Pogonatum dentatum* (Brid.) Brid.
POGO URN	*Pogonatum urnigerum* (Hedw.) P. Beauv.
POHL AND	*Pohlia andalusica* (Höhn.) Broth.
POHL ANN	*Pohlia annotina* (Hedw.) Lindb.
POHL ATR	*Pohlia atropurpurea* (Wahlenb. in Fürnr.) H. Lindb.
POHL BRE	*Pohlia brevinervis* Lindb. & Arnell
POHL BUL	*Pohlia bulbifera* (Warnst.) Warnst.
POHL CAM	*Pohlia camptotrachela* (Ren. & Card.) Broth.
POHL COL	*Pohlia columbica* (Kindb. in Mac. & Kindb.) Andrews
POHL CRU	*Pohlia cruda* (Hedw.) Lindb.
POHL DRU	*Pohlia drummondii* (C. Müll.) Andrews
POHL ELO	*Pohlia elongata* Hedw.
POHL FIL	*Pohlia filiformis* (Dicks.) Andrews in Grout
POHL FIU	*Pohlia filum* (Schimp.) Mårt.
POHL LON	*Pohlia longicolla* (Hedw.) Lindb.
POHL NUT	*Pohlia nutans* (Hedw.) Lindb.
POHL OBT	*Pohlia obtusifolia* (Brid.) L. Koch.
POHL PRO	*Pohlia proligera* (Kindb. ex Breidl.) Lindb. ex Arnell
POHL ROT	*Pohlia rothii* (Corr. ex Limpr.) Broth.
POHL SPH	*Pohlia sphagnicola* (Bruch & Schimp.) Lindb. & Arnell
POHL SPP	*Pohlia* spp.
POHL VEX	*Pohlia vexans* (Limpr.) H. Lindb.
POHL WAH	*Pohlia wahlenbergii* (Web. & Mohr) Andrews
POLY ALP ALP	*Polytrichastrum alpinum* sm. var. *alpinum* (Hedw.) G.L.
POLY ALP	*Polytrichum alpinum* Hedw.
POLY COM	*Polytrichum commune* Hedw.
POLY JUN	*Polytrichum juniperinum* Hedw.
POLY LOG	*Polytrichum longisetum* Brid.
POLY LYA	*Polytrichum lyallii* (Mitt.) Kindb.
POLY PIL	*Polytrichum piliferum* Hedw.
POLY SEN	*Polyblastia sendtneri* Krempelh.
POLY SEX	*Polytrichum sexangulare* Brid.
POLY SPP	*Polytrichum* spp.
POLY STR	*Polytrichum strictum* Brid.
PORE COR	*Porella cordaeana* (Huebener) Moore
PORE NAV	*Porella navicularis* (Lehm. & Lindenb.) Lindb.
PORE PLA	*Porella platyphylla* (L.) Pfeiff.
POTT NEV	*Pottia nevadensis* Card. & Thér.
POTT TRU	*Pottia truncata* (Hedw.) Fürnr. ex B.S.G.
PREI QUA	*Preissia quadrata* (Scop.) Nees
PSEU CAT	*Pseudoleskeella catenulata* (Brid. ex Schrad.) Kindb.
PSEU CIN	*Pseudobryum cinclidioides* (Hüb.) T. Kop.
PSEU TEC	*Pseudoleskeella tectorum* (Funck ex Brid.) Kindb. in Broth.
PTER FIL	*Pterigynandrum filiforme* Hedw.
PTER OVA	*Pterygoneurum ovatum* (Hedw.) Dix.
PTER SUB	*Pterygoneurum subsessile* (Brid.) Jur.
PTIL CIL	*Ptilidium ciliare* (L.) Hampe
PTIL CRI	*Ptilium crista-castrensis* (Hedw.) De Not.
PTIL PUL	*Ptilidium pulcherrimum* (Weber) Vainio
PTIL SPP	*Ptilidium* spp.
PYLA POL	*Pylaisiella polyantha* (Hedw.) Grout
RADU COM	*Radula complanata* (L.) Dumort.
REBO HEM	*Reboulia hemisphaerica* (L.) Raddi
RHAC ACI	*Rhacomitrium aciculare* (Hedw.) Brid.
RHAC CAN	*Rhacomitrium canescens* (Hedw.) Brid.
RHAC ELO	*Rhacomitrium elongatum* Ehrh. ex Frisv.
RHAC FAS	*Rhacomitrium fasciculare* (Hedw.) Brid.
RHAC HET	*Rhacomitrium heterostichum* (Hedw.) Brid.
RHAC LAN	*Rhacomitrium lanuginosum* (Hedw.) Brid.
RHAC SPP	*Rhacomitrium* spp.
RHAC SUD	*Rhacomitrium sudeticum* (Funck) Bruch & Schimp. in B.S.G.
RHAC VAR	*Rhacomitrium varium* (Mitt.) Jaeg.
RHIZ AND	*Rhizomnium andrewsianum* (Steere) T. Kop.
RHIZ GRA	*Rhizomnium gracile* T. Kop.

Appendix 1D. Continued

FECD code	Scientific name
RHIZ MAG	*Rhizomnium magnifolium* (Horik.) T. Kop.
RHIZ NUD	*Rhizomnium nudum* (Britt. & Williams) T. Kop.
RHIZ PSE	*Rhizomnium pseudopunctatum* (Bruch & Schimp.) T. Kop.
RHIZ PUN	*Rhizomnium punctatum* (Hedw.) T. Kop.
RHOD ONT	*Rhodobryum ontariense* (Kindb.) Par. in Kindb.
RHOD ROS	*Rhodobryum roseum* (Hedw.) Limpr.
RHYT LOR	*Rhytidiadelphus loreus* (Hedw.) Warnst.
RHYT ROB	*Rhytidiopsis robusta* (Hook.) Broth.
RHYT RUG	*Rhytidium rugosum* (Hedw.) Kindb.
RHYT SPP	*Rhytidiopsis* spp.
RHYT SQU	*Rhytidiadelphus squarrosus* (Hedw.) Warnst.
RHYT SUB	*Rhytidiadelphus subpinnatus* (Lindb.) T. Kop.
RHYT TRI	*Rhytidiadelphus triquetrus* (Hedw.) Warnst.
RICC BEY	*Riccia beyrichiana* Hampe ex Lehm. & Lindenb.
RICC CAV	*Riccia cavernosa* Hoffm.
RICC CHA	*Riccardia chamedryfolia* (With.) Grolle
RICC LAT	*Riccardia latifrons* (Lindb.) Lindb.
RICC MUL	*Riccardia multifida* (L.) Gray
RICC NAT	*Ricciocarpos natans* (L.) Corda
RICC SPP	*Riccardia* spp.
ROEL ROE	*Roellia roellii* (Broth. in Röll) Andrews ex Crum
SAEL GLA	*Saelania glaucescens* (Hedw.) Broth. in Bomanss. & Broth.
SAUT ALP	*Sauteria alpina* (Nees) Nees
SCAP API	*Scapania apiculata* Spruce
SCAP BRE	*Scapania brevicaulis* Taylor
SCAP CAR	*Scapania carinthiaca* J.B. Jack ex Lindb.
SCAP CUR	*Scapania curta* (Mart.) Dumort.
SCAP CUS	*Scapania cuspiduligera* (Nees) Müll. Frib.
SCAP DEG	*Scapania degenii* Schiffn. ex Müll. Frib.
SCAP GLA	*Scapania glaucocephala* (Taylor) Austin
SCAP IRR	*Scapania irrigua* (Nees) Gottsche & Lindenb. & Nees
SCAP MUC	*Scapania mucronata* H. Buch
SCAP NEM	*Scapania nemorosa* (Linn.) Grolle[b]
SCAP PAL	*Scapania paludicola* Loeske & Müll. Frib.
SCAP PAU	*Scapania paludosa* (Müll. Frib.) Müll. Frib.
SCAP SPP	*Scapania* spp.
SCAP SUB	*Scapania subalpina* (Nees) Dumort.
SCAP UND	*Scapania undulata* (L.) Dumort.
SCHI AGA	*Schistidium agassizii* Sull. & Lesq. in Sull.
SCHI APO	*Schistidium apocarpum* (Hedw.) Bruch & Schimp. in B.S.G.
SCHI PEN	*Schistostega pennata* (Hedw.) Web. & Morh.
SCHI RIV	*Schistidium rivulare* (Brid.) Podp.
SCHI TEN	*Schistidium tenerum* (Zett.) Nyh.
SCLE CES	*Scleropodium cespitans* (C. Müll.) L. Koch
SCLE OBT	*Scleropodium obtusifolium* (Jaeg.) Kindb. in Mac. & Kindb.
SCOR SCO	*Scorpidium scorpioides* (Hedw.) Limpr.
SCOR TUR	*Scorpidium turgescens* (T. Jens.) Loeske
SCOU AQU	*Scouleria aquatica* Hook. in Drumm.
SELI CAL	*Seligeria calcarea* (Hedw.) Bruch & Schimp. in B.S.G.
SELI CAM	*Seligeria campylopoda* Kindb. in Mac. & Kindb.
SELI DON	*Seligeria donniana* (Sm.) C. Müll.
SELI SUB	*Seligeria subimmersa* Lindb.
SELI TRI	*Seligeria tristichoides* Kindb.
SPHA ANG	*Sphagnum angustifolium* (C. Jens. ex Russ.) C. Jens. in Tolf
SPHA BAL	*Sphagnum balticum* (Russ.) C. Jens.
SPHA CAP	*Sphagnum capillifolium* (Ehrh.) Hedw.
SPHA CEN	*Sphagnum centrale* C. Jens. in Arnell & C. Jens.
SPHA COM	*Sphagnum compactum* DC. in Lam. & DC.
SPHA CON	*Sphagnum contortum* Schultz
SPHA FAL	*Sphagnum fallax* (Klinggr.) Klinggr.
SPHA FIM	*Sphagnum fimbriatum* Wils. in Wils. & Hook. f. in Hook. f.
SPHA FUS	*Sphagnum fuscum* (Schimp.) Klinggr.
SPHA GIR	*Sphagnum girgensohnii* Russ.
SPHA JEN	*Sphagnum jensenii* H. Lindb.
SPHA LIN	*Sphagnum lindbergii* Schimp. in Lindb.
SPHA MAG	*Sphagnum magellanicum* Brid.
SPHA MAJ	*Sphagnum majus* (Russ.) C. Jens.
SPHA NEM	*Sphagnum nemoreum* Scop. auct. plur.
SPHA OBT	*Sphagnum obtusum* Warnst.
SPHA REC	*Sphagnum recurvum* P. Beauv.
SPHA RIP	*Sphagnum riparium* Ångstr.
SPHA RUS	*Sphagnum russowii* Warnst.
SPHA SPP	*Sphagnum* spp.
SPHA SQU	*Sphagnum squarrosum* Crome
SPHA SUB	*Sphagnum subsecundum* Nees in Sturm
SPHA TER	*Sphagnum teres* (Schimp.) Ångstr. in Hartm.
SPHA WAR	*Sphagnum warnstorfii* Russ.
SPHA WUL	*Sphagnum wulfianum* Girg.
SPLA AMP	*Splachnum ampullaceum* Hedw.
SPLA LUT	*Splachnum luteum* Hedw.
SPLA RUB	*Splachnum rubrum* Hedw.
SPLA SPH	*Splachnum sphaericum* Hedw.
SPLA SPP	*Splachnum* spp.
SPLA VAS	*Splachnum vasculosum* Hedw.
STEG LAT	*Stegonia latifolia* (Schwaegr. in Schultes) Vent. ex Broth.
STEG SPP	*Stegonia* spp.
TAYL ACU	*Tayloria acuminata* Hornsch.
TAYL FRO	*Tayloria froelichiana* (Hedw.) Mitt. ex Broth.
TAYL HOR	*Tayloria hornschuchii* (Grev. & Arnott) Broth.
TAYL LIN	*Tayloria lingulata* (Dicks.) Lindb.
TAYL SER	*Tayloria serrata* (Hedw.) Bruch & Schimp. in B.S.G.

Appendix 1D. Concluded

FECD code	Scientific name
TAYL SPL	*Tayloria splachnoides* (Schleich. ex Schwaegr.) Hook.
TAYL SPP	*Tayloria* spp.
TETR ANG	*Tetraplodon angustatus* (Hedw.) Bruch & Schimp. in B.S.G.
TETR MNI	*Tetraplodon mnioides* (Hedw.) Bruch & Schimp. in B.S.G.
TETR PEL	*Tetraphis pellucida* Hedw.
TETR SPP	*Tetraphis* spp.
TETR URC	*Tetraplodon urceolatus* (Hedw.) Bruch & Schimp. in Schimp.
THAM NEC	*Thamnobryum neckeroides* (Hook.) Lawt.
THUI ABI	*Thuidium abietinum* (Hedw.) Schimp. in B.S.G.
THUI DEL	*Thuidium delicatulum* (Hedw.) Schimp. in B.S.G.
THUI PYG	*Thuidium pygmaeum* Schimp. in B.S.G.
THUI REC	*Thuidium recognitum* (Hedw.) Lindb.
THUI SPP	*Thuidium* spp.
TIMM AUS	*Timmia austriaca* Hedw.
TIMM BAV	*Timmia bavarica* Hessl.
TIMM MEG	*Timmia megapolitana* Hedw.
TIMM NOR	*Timmia norvegica* Zett.
TIMM SIB	*Timmia sibirica* Lindb. & Arnell
TIMM SPP	*Timmia* spp.
TOME FAL	*Tomentypnum falcifolium* (Ren. ex Nichols) Tuom. in Ahti & Fagers.
TOME NIT	*Tomentypnum nitens* (Hedw.) Loeske
TOME SPP	*Tomentypnum* spp.
TORT CAN	*Tortula caninervis* (Mitt.) Broth.
TORT FRA	*Tortella fragilis* (Hook. & Wils. in Drumm.) Limpr.
TORT HUM	*Tortella humilis* (Hedw.) Jenn.
TORT INC	*Tortella inclinata* (Hedw. f.) Limpr.
TORT MUC	*Tortula mucronifolia* Schwaegr.
TORT NOR	*Tortula norvegica* (Web.) Wahlenb. ex Lindb.
TORT PRI	*Tortula princeps* De Not.
TORT RUR	*Tortula ruralis* (Hedw.) Gaertn. et al.
TORT SPP	*Tortella* spp.
TORT TOR	*Tortella tortuosa* (Hedw.) Limpr.
TRIC CYL	*Trichodon cylindricus* (Hedw.) Schimp.
TRIT EXA	*Tritomaria exsecta* (Schrad.) Loeske
TRIT EXS	*Tritomaria exsectiformis* (Breidl.) Loeske
TRIT HET	*Tritomaria heterophylla* (R.M. Schust.)
TRIT POL	*Tritomaria polita* (Nees) Jörg.
TRIT QUI	*Tritomaria quinquedentata* (Huds.) H. Buch
TRIT SCI	*Tritomaria scitula* (Taylor) Jörg.
TRIT SPP	*Tritomaria* spp.
ULOT CUR	*Ulota curvifolia* (Wahlenb.) Lilj.
VOIT NIV	*Voitia nivalis* Hornsch.
WEIS CON	*Weissia controversa* Hedw.

[a] Based on the Alberta plants and fungi — Master species list and species group checklists provided by the Resource Data Branch, Alberta Sustainable Resource Development, Government of Alberta.

[b] *Chandonanthus setiformis* (Ehrh.) Lindb. and *Scapania nemorosa* (Linn.) Grolle are liverworts, not mosses.

Appendix 1E. Lichens[a]

FECD code	Scientific name
ACAR ARE	*Acarospora arenacea* H. Magn.
ACAR CER	*Acarospora cervina* A. Massal.
ACAR CHL	*Acarospora chlorophana* (Wahlenb.) A. Massal.
ACAR FUS	*Acarospora fuscata* (Schrader) Arnold
ACAR GLA	*Acarospora glaucocarpa* (Ach.) Korber
ACAR HEP	*Acarospora heppii* (Nageli ex Hepp) Nageli ex Korber
ACAR OLI	*Acarospora oligospora* (Nyl.) Arnold
ACAR SCH	*Acarospora schleicheri* (Ach.) A. Massal.
ACAR SMA	*Acarospora smaragdula* (Wahlenb.) A. Massal.
ACAR SPP	*Acarospora* spp.
ACAR STR	*Acarospora strigata* (Nyl.) Jatta
ACAR VER	*Acarospora veronensis* A. Massal.
AHTI SPH	*Ahtiana sphaerosporella* Mull. Arg.) Goward
ALEC NIG	*Alectoria nigricans* (Ach.) Nyl.
ALEC OCH	*Alectoria ochroleuca* (Hoffm.) A. Massal.
ALEC SAR	*Alectoria sarmentosa* (Ach.) Ach.
ALEC SPP	*Alectoria* spp.
ALLA ALP	*Allantoparmelia alpicola* (Th. Fr.) Essl.
ANAP SET	*Anaptychia setifera* Rasanen
ARCT CEN	*Arctoparmelia centrifuga* (L.) Hale
ARCT INC	*Arctoparmelia incurva* (Pers.) Hale
ARCT SUB	*Arctoparmelia subcentrifuga* (Oksner) Hale
ARTH ALP	*Arthrorhaphis alpina* (Schaerer) R. Sant.
ARTH CIT	*Arthrorhaphis citrinella* (Ach.) Poelt
ARTH INT	*Arthonia intexta* Almq.
ARTH PAT	*Arthonia patellulata* Nyl.
ARTH PUN	*Arthopyrenia punctiformis* (Pers.) Massal.
ASPI ALP	*Aspicilia alphoplaca* (Wahlenb.) Poelt & Lauckert
ASPI CAE	*Aspicilia caesiocinerea* (Nyl. ex Malbr.) Arnold
ASPI CAL	*Aspicilia calcarea* (L.) Mudd
ASPI CAN	*Aspicilia candida* (Anzi) Hue
ASPI CIN	*Aspicilia cinerea* (L.) Korber
ASPI ELE	*Aspicilia elevata* (Lyne) J.W. Thomson
ASPI NIK	*Aspicilia nikrapensis* Darbish.
ASPI PER	*Aspicilia pergibbosa* (H. Magn.) Rasanen
ASPI ROL	*Aspicilia rolleana* Hue
ASPI SPP	*Aspicilia* spp.
ASPI SUP	*Aspicilia supertegens* Arnold
BACI ACC	*Bacidia accedens* (Arnold) Lettau
BACI AKA	*Bacidia akompsa* (Tuck.) Fink
BACI BAG	*Bacidia bagliettoana* (A. Massal. & De Not.) Jatta
BACI DEC	*Bacidia declinis* (Tuck.) Zahlbr.
BACI HEG	*Bacidia hegetschweileri* (Hepp) Vainio
BACI POP	*Bacidia populorum* (A. Massal.) Trevisan
BACI SPH	*Bacidia sphaeroides* (Dickson) Zahlbr.
BAEO RUF	*Baeomyces rufus* (Hudson) Rebent.
BELL ALP	*Bellemerea alpina* (Sommerf.) Clauzade & Roux
BELL CIN	*Bellemerea cinereorufescens* (Ach.) Clauzade & Roux
BIAT SPH	*Biatora sphaeroides* (Dickson) Korber
BIAT SPP	*Biatora* spp.
BIAT VER	*Biatora vernalis* (L.) Fr.
BRYO ABB	*Bryoria abbreviata* (Mull. Arg.) Brodo & D. Hawksw.
BRYO CAS	*Bryonora castanea* (Hepp) Poelt
BRYO CHA	*Bryoria chalybeiformis* (L.) Brodo & D. Hawksw.
BRYO DIV	*Bryocaulon divergens* (Ach.) Karnefelt
BRYO FUS	*Bryoria fuscescens* (Gyelnik) Brodo & D. Hawksw.
BRYO GLA	*Bryoria glabra* (Mot.) Brodo & D. Hawksw.
BRYO LAN	*Bryoria lanestris* (Ach.) Brodo & D. Hawksw.
BRYO NAD	*Bryoria nadvornikiana* (Gyelnik) Brodo & D. Hawksw.
BRYO ORE	*Bryoria oregana* (Tuck. ex Willey) Brodo & D. Hawksw.
BRYO PSE	*Bryoria pseudofuscescens* (Gyelnik) Brodo & D. Hawksw.
BRYO SPP	*Bryoria* spp.
BRYO SUB	*Bryoria subdivergens* (E. Dahl) Brodo & D. Hawksw.
BRYO TRI	*Bryoria trichodes* (Michaux) Brodo & D. Hawksw.
BUEL DIS	*Buellia disciformis* (Fr.) Mudd
BUEL ELE	*Buellia elegans* Poelt
BUEL EPI	*Buellia epigaea* (Pers.) Tuck.
BUEL ERU	*Buellia erubescens* Arnold
BUEL LAC	*Buellia lacteoidea* de Lesd.
BUEL PAP	*Buellia papillata* (Sommerf.) Tuck.
BUEL PUN	*Buellia punctata* (Hoffm.) A. Massal.
BUEL SPU	*Buellia spuria* (Schaerer) Anzi
BUEL TRI	*Buellia triphragmioides* Anzi
BUEL VIL	*Buellia vilis* Th. Fr.
CALI ABI	*Calicium abietinum* Pers.
CALI SAL	*Calicium salicinum* Pers.
CALI VIR	*Calicium viride* Pers.
CALO ATR	*Caloplaca atroabla* (Tuck.) Zahlbr.
CALO AUR	*Caloplaca aurantia* (Pers.) Hellbom
CALO CER	*Caloplaca cerina* (Ehrh. ex Hedwig) Th. Fr.
CALO CIT	*Caloplaca citrina* (Hoffm.) Th. Fr.
CALO CLA	*Caloplaca cladodes* (Tuck.) Zahlbr.
CALO EPI	*Caloplaca epithallina* Lynge
CALO FER	*Caloplaca ferruginea* (Hudson) Th. Fr.
CALO FLA	*Caloplaca flavovirescens* (Wulfen) Dall Torre & Sarnth.
CALO FLR	*Caloplaca flavorubescens* (Hudson) J.R. Laundon
CALO FRA	*Caloplaca fraudans* (Th. Fr.) H. Olivier
CALO HOL	*Caloplaca holocarpa* (Hoffm. ex Ach.) M. Wade
CALO JUN	*Caloplaca jungermanniae* (Vahl) Th. Fr.
CALO LAC	*Caloplaca lactea* (A. Massal.) Zahlbr.
CALO MIC	*Caloplaca microphyllina* (Tuck.) Hasse
CALO MUR	*Caloplaca microphyllina* (Tuck.) Hasse
CALO NIV	*Caloplaca nivalis* (Korber) Th. Fr.
CALO SAX	*Caloplaca saxicola* (Hoffm.) Nordin
CALO SIN	*Caloplaca sinapisperma* (Lam. & DC.) Maheu & A. Gillet

Appendix 1E. Continued

FECD code	Scientific name
CALO SPP	*Caloplaca* spp.
CALO STI	*Caloplaca stipitata* Wetmore
CALO TET	*Caloplaca tetraspora* (Nyl.) H. Olivier
CALO TRA	*Caloplaca trachyphylla* (Tuck.) Zahlbr.
CALO ULM	*Caloplaca ulmorum* (Fink) Fink
CALO VIT	*Caloplaca vitellinula* (Nyl.) H. Olivier
CAND AUR	*Candelariella aurella* (Hoffm.) Zahlbr.
CAND CAN	*Candelariella canadensis* H. Magn.
CAND CON	*Candelaria concolor* (Dickson) Stein
CAND SPP	*Candelariella* spp.
CAND TER	*Candelariella terrigena* Rasanen
CAND VIT	*Candelariella vitellina* (Hoffm) Mull. Arg.
CAND XAN	*Candelariella xanthostigma* (Ach.) Lettau
CARB VOR	*Carbonea vorticosa* (Florke) Hertel
CATA CIN	*Catapyrenium cinereum* (pers.) Korber
CATA LAC	*Catapyrenium lachneum* (Ach.) R. Sant.
CATI CHA	*Catillaria chalybeia* (Borrer) A. Massal.
CATI GLA	*Catillaria glauconigrans* (Tuck.) Hasse
CATI GLO	*Catillaria globulosa* (Florke) Th. Fr.
CATI GRI	*Catillaria griffithii* (Sm.) Coppins
CATI LAU	*Catinaria laureri* (Hepp ex Th. Fr.) Degel.
CETR ARE	*Cetraria arenaria* Karnefelt
CETR CAN	*Cetraria canadensis* (Rasanen) Rasanen
CETR CHL	*Cetraria chlorophylla* (Willd.) Vainio
CETR COM	*Cetraria commixta* (Nyl.) Th. Fr.
CETR CUC	*Cetraria cucullata* (Bellardi) Ach.
CETR ERI	*Cetraria ericetorum* Opiz
CETR HAL	*Cetraria halei* Culb. & C. Culb.
CETR HEP	*Cetraria hepatizon* (Ach.) Vainio
CETR ISL	*Cetraria islandica* (L.) Ach.
CETR LAE	*Cetraria laevigata* Rass.
CETR MER	*Cetraria merrillii* Du Rietz
CETR NIV	*Cetraria nivalis* (L.) Ach.
CETR PIN	*Cetraria pinastri* (Scop.) Gray
CETR PLA	*Cetraria platyphylla* Tuck.
CETR SPP	*Cetraria* spp.
CETR SUB	*Cetraria subalpina* Imshaug
CETR TIL	*Cetraria tilesii* Ach.
CHAE CHR	*Chaenotheca chrysocephala* (Turner ex Ach.) Th. Fr.
CHAE FUR	*Chaenotheca furfuracea* (L.) Tibell
CHRY CHL	*Chrysothrix chlorina* (Ach.) J.R. Laundon
CLAD ACU	*Cladonia acuminata* (Ach.) Norrlin
CLAD ALP	*Cladina alpestris* (L.) Nyl.
CLAD AMA	*Cladonia amaurocraea* (Florke) Schaerer
CLAD APO	*Cladonia gonecha* (Ach.) Asah.
CLAD ARB	*Cladina arbuscula* (Wallr.) Hale & Culb.
CLAD BAC	*Cladonia bacillaris* Nyl.
CLAD BAI	*Cladonia bacilliformis* (Nyl.) Gluck
CLAD BEL	*Cladonia bellidiflora* (Ach.) Schaerer
CLAD BOR	*Cladonia borealis* S. Stenroos
CLAD BOT	*Cladonia botrytes* (K. Hagen) Willd.
CLAD BRE	*Cladonia brevis* (Sandst.) Sandst.
CLAD CAN	*Cladonia carneola* (Fr.) Fr.
CLAD CAR	*Cladonia cariosa* (Ach.) Sprengel
CLAD CEN	*Cladonia cenotea* (Ach.) Schaerer
CLAD CER	*Cladonia cervicornis* (Ach.) Flotow
CLAD CHL	*Cladonia chlorophaea* (Florke ex Sommerf.) Sprengel
CLAD COC	*Cladonia coccifera* (L.) Willd.
CLAD CON	*Cladonia coniocraea* auct.
CLAD COR	*Cladonia cornuta* (L.) Hoffm.
CLAD CRI	*Cladonia crispata* (Ach.) Flotow
CLAD CRS	*Cladonia cristatella* Tuck.
CLAD CRY	*Cladonia cryptochlorophaea* Asah.
CLAD CYA	*Cladonia cyanipes* (Sommerf.) Nyl.
CLAD CYL	*Cladonia cylindrica* (A. Evans) A. Evans
CLAD DEC	*Cladonia decorticata* (Florke) Sprengel
CLAD DEF	*Cladonia deformis* (L.) Hoffm.
CLAD DID	*Cladonia didyma* (Fee) Vainio
CLAD DIG	*Cladonia digitata* (L.) Hoffm.
CLAD ECM	*Cladonia ecmocyna* Leighton
CLAD FAR	*Cladonia farinacea* (Vainio) A. Evans
CLAD FIM	*Cladonia fimbriata* (L.) Fr.
CLAD FUR	*Cladonia furcata* (Hudson) Schrader
CLAD GLA	*Cladonia glauca* Florke
CLAD GON	*Cladonia gonecha* (Ach.) Asah.
CLAD GRA	*Cladonia gracilis* (L.) Willd.
CLAD GRY	*Cladonia grayi* (G. Merr. ex Sandst.
CLAD HUM	*Cladonia humilis* (With.) J.R. Laundon
CLAD LEP	*Cladonia leporina* Fr.
CLAD MAC	*Cladonia macilenta* Hoffm.
CLAD MAR	*Cladonia macrophylla* (Schaerer) Stenh.
CLAD MAT	*Cladonia mateocyatha* Robbins
CLAD MAY	*Cladonia macrophyllodes* Nyl.
CLAD MER	*Cladonia merochlorophaea* Asah.
CLAD MET	*Cladonia metacorallifera* Asah.
CLAD MIT	*Cladina mitis* (Sandst.) Hustich
CLAD MUL	*Cladonia multiformis* G. Merr.
CLAD NEM	*Cladonia nemoxyna* (Ach.) Arnold
CLAD PEZ	*Cladonia peziziformis* (With.) J.R. Laundon
CLAD PHY	*Cladonia phyllophora* Ehrh. ex Hoffm.
CLAD PLE	*Cladonia pleurota* (Florke) Schaerer
CLAD POC	*Cladonia pocillum* (Ach.) Grognot
CLAD POL	*Cladonia polydactyla* (Florke) Sprengel
CLAD POY	*Cladonia polycarpoides* Nyl.
CLAD PYX	*Cladonia pyxidata* (L.) Hoffm.
CLAD RAM	*Cladonia ramulosa* (With.) J.R. Laundon
CLAD RAN	*Cladina rangiferina* (L.) Nyl.
CLAD REI	*Cladonia rei* Schaerer
CLAD ROB	*Cladonia robbinsii* A. Evans
CLAD SCA	*Cladonia scabriuscula* (Delise) Nyl.
CLAD SIM	*Cladonia simulata* Robbins
CLAD SOB	*Cladonia sobolescens* Nyl. ex Vainio
CLAD SPE	*Cladina* spp.
CLAD SPP	*Cladonia* spp.
CLAD SQU	*Cladonia squamosa* Hoffm.
CLAD STE	*Cladina stellaris* (Opiz) Brodo
CLAD STR	*Cladonia stricta* (Nyl.) Nyl.
CLAD SUB	*Cladonia subulata* (L.) Weber ex F.H. Wigg.
CLAD SUE	*Cladonia subcervicornis* (Vainio) Kernst.
CLAD SUF	*Cladonia subfurcata* (Nyl.) Arnold
CLAD SUL	*Cladonia sulphurina* (Michaux) Fr.
CLAD SYM	*Cladonia symphycarpa* (Florke) Fr.
CLAD TUR	*Cladonia turgida* Hoffm.
CLAD UNC	*Cladonia uncialis* (L.) F.H. Wigg.

Appendix 1E. Continued

FECD code	Scientific name
CLAD VER	*Cladonia verruculosa* (Vainio) Ahti
CLIO GRI	*Cliostomum griffithii* (Sm.) Coppins
COEL ACU	*Coelocaulon aculeatum* (Schreber) Link
COEL DIV	*Coelocaulon divergens* (Ach.) R. Howe
COLL BAC	*Collema bachmanianum* (Fink) Degel.
COLL CER	*Collema ceraniscum* Nyl.
COLL CRI	*Collema cristatum* (L.) F.H. Wigg.
COLL CRS	*Collema crispum* (Hudson) Weber ex F.H. Wigg.
COLL FLA	*Collema flaccidum* (Ach.) Ach.
COLL FUR	*Collema furfuraceum* (Arnold) Dr Rietz
COLL FUS	*Collema fuscovirens* (With.) J.R. Laundon
COLL LIM	*Collema limosum* (Ach.) Ach.
COLL MUL	*Collema multipartitum* Sm.
COLL NIG	*Collema nigrescens* (Hudson) DC.
COLL POL	*Collema polycarpon* Hoffm.
COLL SPP	*Collema* spp.
COLL SUB	*Collema subflaccidum* Degel.
COLL TEN	*Collema tenax* (Sw.) Ach.
COLL TUN	*Collema tuniforme* (Ach.) Ach.
COLL UND	*Collema undulatum* Laurer ex Flotow
CYPH INQ	*Cyphelium inquinans* (Sm.) Trevisan
CYPH NOT	*Cyphelium notarisii* (Tul.) Blomb. & Forss.
CYPH PIN	*Cyphelium pinicola* Tibell
CYPH SPP	*Cyphelium* spp.
CYPH TIG	*Cyphelium tigillare* (Ach.) Ach.
DACT ARC	*Dactylina arctica* (Richardson) Nyl.
DACT BER	*Dactylina beringica* C.D. Bird & J.W. Thomson
DACT MAD	*Dactylina madreporiformis* (Ach.) Tuck.
DACT RAM	*Dactylina ramulosa* (Hook.) Tuck.
DERM CIN	*Dermatocarpon cinereum* (Pers.) Th. Fr.
DERM HEP	*Dermatocarpon hepaticum* (Ach.) Th.Fr.
DERM INT	*Dermatocarpon intestiniforme* (Korber) Hasse
DERM LAC	*Dermatocarpon lachneum* (Ach.) A.L. Sm.
DERM LUR	*Dermatocarpon luridum* (With.) J.R. Laundon
DERM MIN	*Dermatocarpon miniatum* (L.) W. Mann
DERM MOU	*Dermatocarpon moulinsii* (Mont.) Zahlbr.
DERM RET	*Dermatocarpon reticulatum* H. Magn.
DERM SPP	*Dermatocarpon* spp.
DERM VAG	*Dermatocarpon vagans* Imshaug
DIME ORE	*Dimelaena oreina* (Ach.) Norman
DIPL SCR	*Diploschistes scruposus* (Schreber) Norman
ENDO TOR	*Endocarpon tortuosum* Herre
EPHE LAN	*Ephebe lanata* (L.) Vainio
EUOP GRA	*Euopsis granatina* (Sommerf.) Nyl.
EVER DIV	*Evernia divaricata* (L.) Ach.
EVER MES	*Evernia mesomorpha* Nyl.
EVER PRU	*Evernia prunastri* (L.) Ach.
FARN JUR	*Farnoldia jurana* (Schaerer) Hertel
FLAV CAP	*Flavoparmelia caperata* (L.) Hale
FLAV FLA	*Flavopunctelia flaventior* (Stirton) Hale
FLAV SOR	*Flavopunctelia soredica* (Nyl.) Hale
FULG BRA	*Fulgensia bracteata* (Hoffm.) Rasanen
FULG FUL	*Fulgensia fulgens* (Sw.) Elenkin
FULG SPP	*Fulgensia* spp.
GLYP SCA	*Glypholecia scabra* (Pers.) Mull. Arg.
HAEM LAP	*Haematomma lapponicum* Rasanen
HETE SPE	*Heterodermia speciosa* (Wulfen) Trevisan
HYPO AUS	*Hypogymnia austerodes* (Nyl.) Rasanen
HYPO BIT	*Hypogymnia bitteri* (Lynge) Ahti
HYPO DUP	*Hypogymnia duplicata* (Ach.) Rass.
HYPO ENT	*Hypogymnia enteromorpha* (Ach.) Nyl.
HYPO FRI	*Hypocenomyce friesii* (Ach.) P. James & Gotth. Schneider
HYPO IMS	*Hypogymnia imshaugii* Krog
HYPO ORO	*Hypogymnia oroarctica* Krog
HYPO PHY	*Hypogymnia physodes* (L.) Nyl.
HYPO SCA	*Hypocenomyce scalaris* (Ach.) Choisy
HYPO SUB	*Hypogymnia subobscura* (Vainio) Poelt
HYPO TUB	*Hypogymnia tubulosa* (Schaerer) Hav.
ICMA ERI	*Icmadophila ericetorum* (L.) Zahlbr.
IMSH ALE	*Imshaugia aleurites* (Ach.) S.F. Meyer
IMSH PLA	*Imshaugia placorodia* (Ach.) S.F. Meyer
IONA MEL	*Ionaspis melanocarpa* (Kermpelh.) Arnold
IONA OCH	*Ionaspis ochracella* (Nyl.) H. Magn.
LASA PEN	*Lasallia pensylvanica* (Hoffm.) Llano
LECA ALL	*Lecanora allophana* Nyl.
LECA ARG	*Lecanora argopholis* (Ach.) Ach.
LECA BEH	*Lecanora behringii* Nyl.
LECA CAD	*Lecanora cadubriae* (A. Massal.) Hedl.
LECA CEN	*Lecanora cenisia* Ach.
LECA CIR	*Lecanora circumborealis* Brodo & Vitik.
LECA COI	*Lecanora coilocarpa* (Ach.) Nyl.
LECA CRE	*Lecanora crenulata* Hook.
LECA DIS	*Lecanora dispersa* (Pers.) Sommerf.
LECA DUB	*Lecania dubitans* (Nyl.) A.L. Sm.
LECA EPI	*Lecanora epibryon* (Ach.) Ach.
LECA FSS	*Lecanora fuscescens* (Sommerf.) Nyl.
LECA FUS	*Lecania fuscella* (Schaerer) Korber
LECA HAG	*Lecanora hagenii* (Ach.) Ach.
LECA HYP	*Lecanora hypoptoides* (Nyl.) Nyl.
LECA IMP	*Lecanora impudens* Degel.
LECA INT	*Lecanora intricata* (Ach.) Ach.
LECA MAR	*Lecanora marginata* (Schaerer) Hertel & Rambold
LECA MUR	*Lecanora muralis* (Schreber) Rabenh.
LECA PIN	*Lecanora piniperda* Korber
LECA POL	*Lecanora polytropa* (Hoffm.) Rabenh.
LECA PRI	*Lecanora pringlei* (Tuck.) Lamb
LECA PUL	*Lecanora pulicaris* (Pers.) Ach.
LECA ROL	*Lecanora rolleana* (Hue) Zahlbr.
LECA RUP	*Lecanora rupicola* (L.) Zahlbr.
LECA SCO	*Lecanora scotopholis* (Tuck.) Timdal
LECA SPP	*Lecanora* spp.
LECA SYM	*Lecanora symmicta* (Ach.) Ach.
LECA VAR	*Lecanora varia* (Hoffm.) Ach.
LECI ALB	*Lecidea albofuscescens* Nyl.
LECI ANO	*Lecidella anomaloides* (A. Massal.) Hertel & R. Kilias
LECI ARM	*Lecidea armeniaca* (DC.) Fr.
LECI ATM	*Lecidea atromarginata* H. Magn.

Appendix 1E. Continued

FECD code	Scientific name
LECI ATR	*Lecidea atrobrunnea* (Raymond ex Lam. & DC.) Schaerer
LECI AUR	*Lecidea auriculata* Th. Fr.
LECI BER	*Lecidea berengeriana* (A. Massal.) Nyl.
LECI CAE	*Lecidea caesioatra* Schaerer
LECI CAR	*Lecidella carpathica* Korber
LECI CIN	*Lecidea cinnabarina* Sommerf.
LECI CON	*Lecidea confluens* (Weber) Ach.
LECI DEM	*Lecidoma demissum* (Rustr.) Gotth. Schneider & Hertel
LECI EUP	*Lecidella euphorea* (Florke) Hertel
LECI FUS	*Lecidea fuscatoatra* Nyl.
LECI GLM	*Lecidea glomerulosa* (DC.) Steudel
LECI GLO	*Lecidea globifera* Ach.
LECI GRA	*Lecidella granulata* (H. Magn.) R.C. Harris
LECI HYN	*Lecidea hypnorum* Lib.
LECI HYP	*Lecidea hypocrita* A. Massal.
LECI INT	*Lecidea intrudens* H. Magn.
LECI LAC	*Lecidea lactea* Florke ex Schaerer
LECI LAP	*Lecidea lapicida* (Ach.) Ach.
LECI LEU	*Lecidea leucothallina* Arnold
LECI LIT	*Lecidea lithophila* (Ach.) Ach.
LECI MAR	*Lecidea marginata* Schaerer
LECI MEL	*Lecidea melaphanoides* Nyl.
LECI PAN	*Lecidea panaeola* (Ach.) Ach.
LECI PAU	*Lecidea paupercula* Th. Fr.
LECI PLA	*Lecidea plana* (J. Lahm) Nyl.
LECI SCA	*Lecidella scabra* (Taylor) Hertel & Leuckert
LECI SPI	*Lecidella spitsbergensis* (Lynge) Hertel & Leuckert
LECI SPP	*Lecidea* spp.
LECI STI	*Lecidella stigmatea* (Ach.) Hertel & Leuckert
LECI SYM	*Lecidea symmicta* (Ach.) Ach.
LECI TES	*Lecidea tessellata* Florke
LECI TOR	*Lecidea tornoensis* Nyl.
LECI TUR	*Lecidea turgidula* Fr.
LECI ULI	*Lecidea uliginosa* (Schrader) Ach.
LECI UMB	*Lecidea umbonata* (Hepp) Mudd
LECI VAR	*Lecidea varians* Ach.
LECI VER	*Lecidea vernalis* (L.) Ach.
LECI WUL	*Lecidella wulfenii* (Hepp) Korber
LEMP RAD	*Lempholemma radiatum* (Sommerf.) Henssen
LEPR INC	*Lepraria incana* (L.) Ach.
LEPR MEM	*Lepraria membranacea* (Dickson) Vainio
LEPR NEG	*Lepraria neglecta* (Nyl.) Erichsen
LEPR SPP	*Lepraria* spp.
LEPR SUB	*Leprocaulon subalbicans* (Lamb) Lamb & Ward
LEPT BUR	*Leptogium burnetiae* (C.W. Dodge
LEPT FUR	*Leptogium furfuraceum* (Harm.) Sierk
LEPT GEL	*Leptogium gelatinosum* (With.) J.R. Laundon
LEPT HIR	*Leptogium hirsutum* Sierk
LEPT LIC	*Leptogium lichenoides* (L.) Zahlbr.
LEPT SAT	*Leptogium saturninum* (Dickson) Nyl.
LEPT SPP	*Leptogium* spp.
LEPT TEN	*Leptogium tenuissimum* (Dickson) Korber
LEPT TER	*Leptogium teretiusculum* (Wallr.) Arnold
LICH SCO	*Lichenothelia scopularia* (Nyl.) D. Hawksw.
LICH SPP	Lichen species
LOBA LIN	*Lobaria linita* (Ach.) Rabenh.
LOBA ORE	*Lobaria oregana* (Tuck.) Mull. Arg.
LOBA PUL	*Lobaria pulmonaria* (L.) Hoffm.
LOPA PEZ	*Lopadium pezizoideum* (Ach.) Korber
MEGA VER	*Megaspora verrucosa* (Ach.) Hafellner & V. Wirth
MELA ALB	*Melanelia albertana* (Ahti) Essl.
MELA DIS	*Melanelia granulosa* (Lynge) Essl.
MELA EXA	*Melanelia exasperata* (De Not.) Essl.
MELA EXS	*Melanelia exasperatula* (Nyl.) Essl.
MELA INC	*Melanelia incolorata* (Parr.) Essl.
MELA INF	*Melanelia infumata* (Nyl.) Essl.
MELA MUL	*Melanelia multispora* (A. Schneider) Essl.
MELA OLI	*Melanelia olivacea* (L.) Eassl.
MELA PAN	*Melanelia panniformis* (Nyl.) Essl.
MELA SEP	*Melanelia septentrionalis* (Lynge) Essl.
MELA SOR	*Melanelia sorediata* (Ach.) Goward & Ahti
MELA STY	*Melanelia stygia* (L.) Essl.
MELA SUA	*Melanelia subargentifera* (Nyl.) Essl.
MELA SUB	*Melanelia subaurifera* (Nyl.) Essl.
MELA SUE	*Melanelia subelegantula* (Essl.) Essl.
MELA SUO	*Melanelia subolivacea* (Nyl.) Essl.
MELA SUS	*Melanelia substygia* (Rasanèn) Essl.
MELA TRA	*Melanelia trabeculata* (Ahti) Essl.
MICA ASS	*Micarea assimilata* (Nyl.) Coppins
MYCO AFF	*Mycoblastus affinis* (Schaerer) Schauer
MYCO BER	*Mycobilimbia berengeriana* (A. Massal.) Hafellner & V. Wirth
MYCO LOB	*Mycobilimbia lobulata* (Sommerf.) Hafellner
MYCO OBS	*Mycobilimbia fusca* (A. Massal.) Hafellner & V. Wirth
MYCO SAB	*Mycobilimbia sabuletorum* (Schreber) Hafellner
MYCO SAN	*Mycoblastus sanguinarius* (L.) Norman
MYCO SUB	*Mycocalicium subtile* (Pers.) Szat.
NEPH ARC	*Nephroma arcticum* (L.) Torss.
NEPH BEL	*Nephroma bellum* (Sprengel) Tuck.
NEPH EXP	*Nephroma expallidum* (Nyl.) Nyl.
NEPH HEL	*Nephroma helveticum* Ach.
NEPH PAR	*Nephroma parile* (Ach.) Ach.
NEPH RES	*Nephroma resupinatum* (L.) Ach.
NEPH SPP	*Nephroma* spp.
OCHR AND	*Ochrolechia androgyna* (Hoffm.) Arnold
OCHR ARB	*Ochrolechia arborea* (Kreyer) Almb.
OCHR FRI	*Ochrolechia frigida* (Sw.) Lynge
OCHR GEM	*Ochrolechia geminipara* (Th. Fr.) Vainio
OCHR INA	*Ochrolechia inaequatula* (Nyl.) Zahlbr.
OCHR PAL	*Ochrolechia pallescens* (L.) A. Massal.
OCHR SOR	*Ochrolechia sorediosa* Howard
OCHR SPP	*Ochrolechia* spp.

Appendix 1E. Continued

FECD code	Scientific name
OCHR UPS	*Ochrolechia upsaliensis* (L.) A. Massal.
OPEG VAR	*Opegrapha varia* Pers.
OPHI LAP	*Ophioparma lapponica* (Rasanen) Hafellner & R.W. Rogers
ORPH MOR	*Orphniospora moriopsis* (A. Massal.) D. Hawksw.
PANN CON	*Pannaria conoplea* (Ach.) Bory
PANN LEU	*Pannaria leucophaea* (Vahl) P.M. Jorg.
PANN MIC	*Pannaria microphylla* (Sw.) A. Massal.
PANN PEZ	*Pannaria pezizoides* (Weber) Trevisan
PANN RUB	*Pannaria rubiginosa* (Ach.) Bory
PARM AMB	*Parmeliopsis ambigua* (Wulfen) Nyl.
PARM CEN	*Parmelia centrifuga* (L.) Ach.
PARM CHL	*Parmelia chlorochroa* Tuck.
PARM DIS	*Parmelia dissecta* Nyl.
PARM ELE	*Parmelia elegantula* (Zahlbr.) Szat.
PARM EXA	*Parmelia exasperata* De Not.
PARM HYP	*Parmeliopsis hyperopta* (Ach.) Arnold
PARM INF	*Parmelia infrapallida* Essl,.
PARM LIN	*Parmelia lineola* E.C. Berry
PARM PER	*Parmelia perforata* (Jacq.) Ach.
PARM SAX	*Parmelia saxatilis* (L.) Ach.
PARM SPH	*Parmelia sphaerospora* Nyl.
PARM SPP	*Parmelia* spp.
PARM SUL	*Parmelia sulphurata* Nees & Flotow
PARM TAR	*Parmelia taractica* Krempelh.
PARM WYO	*Parmelia wyomingica* (Gyelnik) Hale
PELT APH	*Peltigera aphthosa* (L.) Willd.
PELT CAN	*Peltigera canina* (L.) Willd.
PELT COL	*Peltigera collina* (Ach.) Schrader
PELT DID	*Peltigera didactyla* (With.) J.R. Laundon
PELT ELI	*Peltigera elisabethae* Gyelnik
PELT HOR	*Peltigera horizontalis* (Hudson) Baumg.
PELT LEP	*Peltigera lepidophora* (Vainio) Bitter
PELT LEU	*Peltigera leucophlebia* (Nyl.) Gyelnik
PELT MAL	*Peltigera malacea* (Ach.) Funck
PELT MEM	*Peltigera membranacea* (Ach.) Nyl.
PELT NEO	*Peltigera neopolydactyla* (Gyelnik) Gyelnik
PELT POL	*Peltigera polydactyla* (Necker) Hoffm.
PELT PRA	*Peltigera praetextata* (Florke ex Sommerf.) Zopf
PELT RUF	*Peltigera rufescens* (Weiss) Humb.
PELT SCA	*Peltigera scabrosa* Th. Fr.
PELT SPP	*Peltigera* spp.
PELT SPU	*Peltigera spuria* (Ach.) DC.
PELT VEN	*Peltigera venosa* (L.) Hoffm.
PERT BRY	*Pertusaria bryontha* (Ach.) Nyl.
PERT DAC	*Pertusaria dactylina* (Ach.) Nyl.
PERT GEM	*Pertusaria geminipara* (Th. Fr.) C. Knight ex Brodo
PERT PAN	*Pertusaria panyrga* (Ach.) A. Massal.
PERT SOM	*Pertusaria sommerfeltii* (Florke ex Sommerf.) Fr.
PERT SPP	*Pertusaria* spp.
PERT TRO	*Pertusaria trochisea* Norman
PHAE CON	*Phaeophyscia constipata* (Norrlin & Nyl.) Moberg
PHAE END	*Phaeophyscia endococcina* (Korber) Moberg
PHAE HIS	*Phaeophyscia hispidula* (Ach.) Essl.
PHAE NIM	*Phaeorrhiza nimbosa* (Fr.) H. Mayrh. & Poelt
PHAE ORB	*Phaeophyscia orbicularis* (Necker) Moberg
PHAE POP	*Phaeocalicium populneum* (Brond. ex Duby) A.F.W. Schmidt
PHAE SCI	*Phaeophyscia sciastra* (Ach.) Moberg
PHYL DEM	*Phylliscum demangeonii* (Moug. & Mont.) Nyl.
PHYS ADS	*Physcia adscendens* (Fr.) H. Olivier
PHYS AIP	*Physcia aipolia* (Ehrh. ex Humb.) Furnr.
PHYS BIZ	*Physcia biziana* (A. Massal.) Zahlbr.
PHYS CAE	*Physcia caesia* (Hoffm.) Furnr.
PHYS CIL	*Physcia ciliata* (Hoffm.) Du Rietz
PHYS DET	*Physconia detersa* (Nyl.) Poelt
PHYS DIS	*Physconia distorta* (With.) Laundon
PHYS DUB	*Physcia dubia* (Hoffm.) Lettau
PHYS END	*Physcia endochrysea* (Hampe) Nyl.
PHYS GRI	*Physconia grisea* (Lam.) Poelt
PHYS MIL	*Physcia millegrana* Degel.
PHYS MUS	*Physconia muscigena* (Ach.) Poelt
PHYS NIG	*Physcia nigricans* (Florke) Stizenb.
PHYS ORB	*Physcia orbicularis* (Necker) Poetsch
PHYS PER	*Physconia perisidiosa* (Erichsen) Moberg
PHYS PHA	*Physcia phaea* (Tuck.) J.W. Thomson
PHYS SCI	*Physcia sciastra* (Ach.) Du Rietz
PHYS SEM	*Physcia semipinnata* (J.F. Gmelin) Moberg
PHYS SET	*Physcia setosa* (Ach.) Nyl.
PHYS SPP	*Physcia* spp.
PHYS STE	*Physcia stellaris* (L.) Nyl.
PHYS SUB	*Physcia subobscura* Nyl.
PHYS TEN	*Physcia tenella* (Scop.) DC.
PLAC ASP	*Placynthium asperellum* (Ach.) Trevisan
PLAC NIG	*Placynthium nigrum* (Hudson) Gray
PLAC OLI	*Placynthiella oligotropha* (J.R. Laundon) Coppins & P. James
PLAC STE	*Placynthium stenophyllum* (Tuck.) Fink
PLAC SUB	*Placynthium subradiatum* (Nyl.) Arnold
PLAC ULI	*Placynthiella uliginosa* (Schrader) Coppins & P. James
PLAT GLA	*Platismatia glauca* (L.) Culb. & C. Culb.
POLY HYP	*Polyblastia hyperborea* Th. Fr.
POLY OBS	*Polyblastia obsoleta* Arnold
POLY SIM	*Polysporina simplex* (Davies) Vezda
POLY THE	*Polyblastia theleodes* (Sommerf.) Th. Fr.
PORP CRU	*Porpidia crustulata* (Ach.) Hertel & Knoph
PORP FLA	*Porpidia flavocaerulescens* (Hornem.) Hertel & A.J. Schwab
PORP GLA	*Porpidia glaucophaea* (Korber) Hertel & Knoph
PORP MAC	*Porpidia macrocarpa* (DC.) Hertel & A.J. Schwab
PORP THO	*Porpidia thomsonii* Gowan
PROT BAD	*Protoparmelia badia* (Hoffm.) Hafellner
PROT RUP	*Protoblastenia rupestris* (Scop.) J. Steiner

Appendix 1E. Continued

FECD code	Scientific name
PSEU MIN	*Pseudephebe minuscula* (Nyl. ex Arnold) Brodo & D. Hawksw.
PSEU PUB	*Pseudephebe pubescens* (L.) Choisy
PSOR DEC	*Psora decipiens* (Hedwig) Hoffm.
PSOR GLO	*Psora globifera* (Ach.) A. Massal.
PSOR HYP	*Psoroma hypnorum* (Vahl) Gray
PSOR RUB	*Psora rubiformis* (Ach.) Hook.
PSOR RUF	*Psorula rufonigra* (Tuck.) Gotth.
PUNC SUR	*Punctelia subrudecta* (Nyl.) Krog
PYRE LEU	*Pyrenula leucoplaca* (Wallr.) Korber
RAMA FAS	*Ramalina fastigiata* (Pers.) Ach.
RAMA POL	*Ramalina pollinaria* (Westr.) Ach.
RAMA ROE	*Ramalina roesleri* (Hochst. ex Schaerer) Hue
RAMA SIN	*Ramalina sinensis* Jatta
RAMA SPP	*Ramalina* spp.
RHIZ ALP	*Rhizocarpon alpicola* (Anzi) Rabenh.
RHIZ BAD	*Rhizocarpon badioatrum* (Florke ex Sprengel) Th. Fr.
RHIZ BOL	*Rhizocarpon bolanderi* (Tuck.) Herre
RHIZ CHI	*Rhizocarpon chioneum* (Norman) Th. Fr.
RHIZ CHR	*Rhizoplaca chrysoleuca* (Sm.) Zopf
RHIZ DIS	*Rhizocarpon disporum* (Naeg. ex Hepp) Mull. Arg.
RHIZ EUM	*Rhizocarpon eupetraeum* (Nyl.) Arnold
RHIZ EUP	*Rhizocarpon eupetraeoides* (Nyl.) Blomb. & Forss.
RHIZ GEO	*Rhizocarpon geographicum* (L.) DC.
RHIZ GER	*Rhizocarpon geminatum* Korber
RHIZ GRN	*Rhizocarpon grande* (Florke ex Flotow) Arnold
RHIZ INT	*Rhizocarpon intermediellum* Rasanen
RHIZ MAC	*Rhizocarpon macrosporum* Rasanen
RHIZ MEL	*Rhizoplaca melanophthalma* (DC.) Leuckert & Poelt
RHIZ POL	*Rhizocarpon polycarpum* (Hepp) Th. Fr.
RHIZ RIP	*Rhizocarpon riparium* Rasanen
RHIZ SUP	*Rhizocarpon superficiale* (Schaerer) Vainio
RINO ANN	*Rinodina annulata* H. Magn.
RINO ARC	*Rinodina archaea* (Ach.) Arnold
RINO BIS	*Rinodina bischoffii* (Hepp) A. Massal.
RINO CAL	*Rinodina calcigena* (Th. Fr.) Lynge
RINO MIL	*Rinodina milliaria* Tuck.
RINO MNI	*Rinodina mniaraea* (Ach.) Korber
RINO NIM	*Rinodina nimbosa* (Fr.) Th. Fr.
RINO OCC	*Rinodina occidentalis* Lynge
RINO POL	*Rinodina polyspora* Th. Fr.
RINO PYR	*Rinodina pyrina* (Ach.) Arnold
RINO ROS	*Rinodina roscida* (Sommerf.) Arnold
RINO SPP	*Rinodina* spp.
RINO TUR	*Rinodina turfacea* (Wahlenb.) Korber
SARC NOV	*Sarcogyne novomexicana* H. Magn.
SARC PRI	*Sarcogyne privigna* (Ach.) A. Massal.
SARC SIM	*Sarcogyne similis* H. Magn.
SARC SPP	*Sarcogyne* spp.
SCHA CIN	*Schaereria cinereorufa* (Schaerer) Th. Fr.
SCHA TEN	*Schaereria tenebrosa* (Flotow) Hertel & Poelt
SCOL CHL	*Scoliciosporum chlorococcum* (Stenh.) Vezda
SOLO AST	*Solorinella asteriscus* Anzi
SOLO BIS	*Solorina bispora* Nyl.
SOLO CRO	*Solorina crocea* (L.) Ach.
SOLO OCT	*Solorina octospora* (Arnold) Arnold
SOLO SAC	*Solorina saccata* (L.) Ach.
SOLO SPO	*Solorina spongiosa* (Ach.) Anzi
SOLO SPP	*Solorina* spp.
SPHA GLO	*Sphaerophorus globosus* (Hudson) Vainio
SPIL REV	*Spilonema revertens* Nyl.
SPOR POL	*Sporastatia polyspora* (Nyl.) Grummann
SPOR TES	*Sporastatia testudinea* (Ach.) A. Massal.
SQUA LEN	*Squamarina lentigera* (Weber) Poelt
STAU CAT	*Staurothele catalepta* (Ach.) Blomb. & Forss.
STAU CLO	*Staurothele clopima* (Wahlenb.) Th. Fr.
STAU FUS	*Staurothele fuscocuprea* (Nyl.) Zschacke
STAU PER	*Staurothele perradiata* Lynge
STAU SPP	*Staurothele* spp.
STER ALB	*Stereocaulon albicans* Th. Fr.
STER ALP	*Stereocaulon alpinum* Laurer ex Funck
STER BOT	*Stereocaulon botryosum* Ach.
STER CON	*Stereocaulon condensatum* Hoffm.
STER DAC	*Stereocaulon dactylophyllum* Florke
STER PAS	*Stereocaulon paschale* (L.) Hoffm.
STER PIL	*Stereocaulon pileatum* Ach.
STER RIV	*Stereocaulon rivulorum* H. Magn.
STER SAX	*Stereocaulon saxatile* H. Magn.
STER SPP	*Stereocaulon* spp.
STER TOM	*Stereocaulon tomentosum* Fr.
SYNA SYM	*Synalissa symphorea* (Ach.) Nyl.
TEPH ATR	*Tephromela atra* (Hudson) Hafellner
THAM SPP	*Thamnolia* spp.
THAM SUB	*Thamnolia subuliformis* (Ehrh.) Culb.
THAM VER	*Thamnolia vermicularis* (Sw.) Ach. ex Schaerer
THEL DEC	*Thelidium decipiens* (Nyl.) Krempelh.
THEL PYR	*Thelidium pyrenophorum* (Ach.) Mudd
TONI CAE	*Toninia caeruleonigricans* auct.
TONI CAN	*Toninia candida* (Weber) Th. Fr.
TONI TRI	*Toninia tristis* (Th. Fr.) Th. Fr.
TRAP GRA	*Trapeliopsis granulosa* (Hoffm.)
TREM ATR	*Tremolecia atrata* (Ach.) Hertel
TREM JUR	*Tremolecia jurana* (Schaerer) Hertel
TUCK AME	*Tuckermannopsis americana* (Sprengel) Hale
TUCK CAN	*Tuckermannopsis canadensis* (Rasanen) Hale
TUCK CHL	*Tuckermannopsis chlorophylla* (Willd.) Hale
TUCK CIL	*Tuckermannopsis ciliaris* (Ach.) Gyelnik
TUCK MER	*Tuckermannopsis merrillii* (Du Rietz) Hale
TUCK PIN	*Tuckermannopsis pinastri* (Scop.) Hale
TUCK PLA	*Tuckermannopsis platyphylla* (Tuck.)
TUCK SEP	*Tuckermannopsis sepincola* (Ehrh.) Hale
TYLO BIF	*Tylothallia biformigera* (Leighton) P. James & R. Kilias
UMBI ANG	*Umbilicaria angulata* Tuck.
UMBI ARC	*Umbilicaria arctica* (Ach.) Nyl.

Appendix 1E. Concluded

FECD code	Scientific name
UMBI CYL	*Umbilicaria cylindrica* (L.) Delise ex Duby
UMBI DEC	*Umbilicaria decussata* (Vill.) Zahlbr.
UMBI DEU	*Umbilicaria deusta* (L.) Baumg.
UMBI HYP	*Umbilicaria hyperborea* (Ach.) Hoffm.
UMBI KRA	*Umbilicaria krascheninnikovii* (Savicz) Zahlbr.
UMBI LAM	*Umbilicaria lambii* Imshaug
UMBI MAM	*Umbilicaria mammulata* (Ach.) Tuck.
UMBI MUE	*Umbilicaria muehlenbergii* (Ach.) Tuck.
UMBI PHA	*Umbilicaria phaea* Tuck.
UMBI POL	*Umbilicaria polyphylla* (L.) Baumg.
UMBI PRO	*Umbilicaria proboscidea* (L.) Schrader
UMBI RIG	*Umbilicaria rigida* (Du Rietz) Frey
UMBI SPP	*Umbilicaria* spp.
UMBI TOR	*Umbilicaria torrefacta* (Lightf.) Schrader
UMBI VEL	*Umbilicaria vellea* (L.) Ach.
UMBI VIR	*Umbilicaria virginis* Schaerer
USNE ALP	*Usnea alpina* Mot.
USNE COM	*Usnea compacta* (Rasanen) Mot.
USNE GLA	*Usnea glabrata* (Ach.) Vainio
USNE HIR	*Usnea hirta* (L.) F.H. Wigg.
USNE SOR	*Usnea sorediifera* (Arnold) Lynge
USNE SPP	*Usnea* spp.
VARI KEM	*Varicellaria kemensis* Rasanen
VARI RHO	*Varicellaria rhodocarpa* (Korber) Th. Fr.
VERR CAL	*Verrucaria calkinsiana* Servit
VERR FUS	*Verrucaria fuscella* (Turner) Winch
VERR MUR	*Verrucaria muralis* Ach.
VERR NIG	*Verrucaria nigrescens* Pers.
VERR RUD	*Verrucaria ruderella* Nyl.
VERR SPP	*Verrucaria* spp.
VERR VIR	*Verrucaria virens* Nyl.
XANT CAN	*Xanthoria candelaria* (L.) Th. Fr.
XANT CHL	*Xanthoparmelia chlorochroa* (Tuck.) Hale
XANT CON	*Xanthoparmelia conspersa* (Ehrh. ex Ach.) Hale
XANT ELE	*Xanthoria elegans* (Link) Th. Fr.
XANT FAL	*Xanthoria fallax* (Hepp) Arnold
XANT LIN	*Xanthoparmelia lineola* (E.C. Berry) Hale
XANT POL	*Xanthoria polycarpa* (Hoffm.) Rieber
XANT SOR	*Xanthoria sorediata* (Vainio) Poelt
XANT SPP	*Xanthoria* spp.
XANT TAR	*Xanthoparmelia coloradoensis* (Gyelnik) Hale
XANT WYO	*Xanthoparmelia wyomingica* (Gyelnik) Hale
XYLO ABI	*Xylographa abietina* (Pers.) Zahlbr.
XYLO VIT	*Xylographa vitiligo* (Ach.) J.R. Laundon
ZAHL CAL	*Zahlbrucknerella calcarea* (Herre) Herre

[a] Based on the Alberta plants and fungi — Master species list and species group checklists provided by the Resource Data Branch, Alberta Sustainable Resource Development, Government of Alberta.

APPENDIX 2

REFERENCES FOR BIOMASS EQUATIONS

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APPENDIX 3

SUMMARY OF SELECTED SITE CHARACTERISTICS AND CARBON STOCKS FOR ALL PLOTS

Appendix 3A. Summary of selected site characteristics by plot, sorted alphabetically by province or territory and terrestrial ecozone

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ARNEWS	PLOT 820	AB	53° 32'	117° 49'	Boreal Plains	58	N.D.[b]	N.T.[c]	PICE GLA
ESIS	34CB2457	AB	52° 57'	116° 45'	Boreal Plains	133	Well	PICE ENG	ABIE LAS
ESIS	34CB2462	AB	52° 51'	116° 37'	Boreal Plains	62	Rapidly	N.T.	PICE ENG
ESIS	34CB2466	AB	53° 07'	116° 56'	Boreal Plains	72	Well	PINU CON	PINU CON
ESIS	34CB2467	AB	53° 18'	117° 13'	Boreal Plains	70	Well	PINU CON	N.T.
ESIS	34CB4475	AB	53° 28'	116° 30'	Boreal Plains	59	Well	POPU TRE	POPU TRE
ESIS	34CB4476	AB	53° 28'	116° 30'	Boreal Plains	94	Very poorly	PICE MAR	PICE MAR
ESIS	34CB4477	AB	53° 28'	116° 22'	Boreal Plains	72	Well	POPU TRE	PICE GLA
ESIS	34CB4478	AB	53° 28'	116° 30'	Boreal Plains	32	Very poorly	LARI LAR	PICE MAR
ESIS	34CB4479	AB	53° 23'	116° 39'	Boreal Plains	33	Very poorly	PICE MAR	PICE MAR
ESIS	34CB4480	AB	53° 28'	116° 48'	Boreal Plains	51	Well	PICE GLA	PINU CON
ESIS	34CB4481	AB	53° 33'	117° 06'	Boreal Plains	26	Very poorly	LARI LAR	LARI LAR
ESIS	34CB4482	AB	53° 33'	116° 39'	Boreal Plains	62	Well	POPU TRE	POPU TRE
ESIS	34CB4483	AB	53° 18'	117° 39'	Boreal Plains	34	Rapidly	PICE GLA	N.T.
ESIS	34CB4484	AB	53° 18'	116° 47'	Boreal Plains	60	Poorly	PICE MAR	PICE MAR
ESIS	34CB4485	AB	53° 18'	116° 38'	Boreal Plains	68	Moderately well	POPU TRE	POPU TRE
ESIS	34CB4487	AB	53° 12'	116° 29'	Boreal Plains	40	Very poorly	PICE MAR	N.T.
ESIS	34CB4488	AB	53° 18'	117° 39'	Boreal Plains	38	Well	PICE GLA	PICE GLA
ESIS	34CB4489	AB	53° 12'	116° 29'	Boreal Plains	118	Very poorly	PICE MAR	PICE MAR
ESIS	34CB4490	AB	53° 12'	116° 38'	Boreal Plains	90	Moderately well	PINU CON	PICE MAR
ESIS	34CB4637	AB	53° 18'	116° 38'	Boreal Plains	98	Moderately well	POPU TRE	PINU CON
ESIS	34CB4652	AB	53° 23'	116° 39'	Boreal Plains	34	Very poorly	LARI LAR	N.T.
ESIS	34CB4653	AB	53° 18'	116° 38'	Boreal Plains	75	Rapidly	PINU CON	N.T.
ESIS	34CB4655	AB	53° 07'	116° 56'	Boreal Plains	64	Moderately well	PINU CON	PINU CON
ESIS	34CB8558	AB	53° 02'	116° 29'	Boreal Plains	69	Moderately well	PINU CON	PINU CON
ESIS	34CB8559	AB	53° 02'	116° 29'	Boreal Plains	91	Poorly	PICE GLA	PICE GLA
ESIS	34CB8563	AB	53° 07'	117° 04'	Boreal Plains	75	Well	PINU CON	PINU CON
ESIS	34CB8564	AB	53° 07'	117° 04'	Boreal Plains	72	N.D.	PINU CON	PINU CON
ESIS	34CB8566	AB	53° 18'	116° 56'	Boreal Plains	74	Well	N.T.	POPU TRE
ESIS	34CB8571	AB	53° 12'	117° 13'	Boreal Plains	75	N.D.	PICE GLA	PICE GLA
ESIS	34CB8574	AB	53° 23'	116° 57'	Boreal Plains	88	Moderately well	PINU CON	PINU CON
ESIS	34CB8575	AB	53° 23'	116° 48'	Boreal Plains	81	Well	POPU TRE	N.T.
ESIS	34CB8577	AB	53° 18'	117° 04'	Boreal Plains	79	Well	POPU TRE	POPU TRE
ESIS	34CB8578	AB	53° 12'	116° 56'	Boreal Plains	52	Well	POPU TRE	N.T.
ESIS	34CB8579	AB	53° 18'	116° 47'	Boreal Plains	72	Rapidly	POPU TRE	N.T.
ESIS	34CB8580	AB	53° 07'	116° 56'	Boreal Plains	68	Well	PINU CON	PINU CON
ESIS	34CB8583	AB	53° 12'	116° 56'	Boreal Plains	46	Well	PINU CON	N.T.

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ESIS	34CB8584	AB	52° 57'	116° 37'	Boreal Plains	134	Very poorly	PICE MAR	N.T.
ESIS	34CB8591	AB	52° 51'	116° 37'	Boreal Plains	34	Rapidly	PINU CON	N.T.
ESIS	34CB8592	AB	52° 51'	116° 28'	Boreal Plains	90	Moderately well	PINU CON	PICE ENG
ESIS	34CB8593	AB	53° 18'	117° 31'	Boreal Plains	58	Well	PICE ENG	PICE ENG
ESIS	34CB8602	AB	53° 12'	117° 22'	Boreal Plains	94	Well	PINU CON	PINU CON
ESIS	34CB8607	AB	52° 51'	116° 37'	Boreal Plains	103	Poorly	POPU BAL	PICE MAR
ESIS	34CB8617	AB	52° 51'	116° 28'	Boreal Plains	38	Moderately well	N.T.	PINU CON
ESIS	34CB8618	AB	53° 02'	116° 29'	Boreal Plains	76	Well	N.T.	POPU TRE
ESIS	34CB8619	AB	52° 51'	116° 28'	Boreal Plains	78	Rapidly	PINU CON	N.T.
ESIS	34CB8620	AB	53° 18'	117° 22'	Boreal Plains	60	Rapidly	PINU CON	PICE ENG
ESIS	34CB8624	AB	53° 18'	117° 13'	Boreal Plains	69	Moderately well	PINU CON	PICE GLA
ESIS	34CB8652	AB	53° 12'	116° 56'	Boreal Plains	70	Well	PINU CON	PINU CON
ESIS	34CB8654	AB	53° 12'	116° 29'	Boreal Plains	103	Well	PINU CON	PINU CON
ESIS	34ET4350	AB	51° 28'	114° 58'	Boreal Plains	62	Moderately well	PINU CON	N.T.
ESIS	34ET4351	AB	51° 35'	114° 59'	Boreal Plains	82	Well	PICE GLA	N.T.
ESIS	34ET4352	AB	51° 38'	115° 07'	Boreal Plains	104	Moderately well	PICE GLA	N.T.
ESIS	34ET4353	AB	51° 38'	115° 07'	Boreal Plains	69	Imperfectly	PINU CON	N.T.
ESIS	34ET4354	AB	51° 28'	114° 56'	Boreal Plains	67	Moderately well	PICE MAR	N.T.
ESIS	34ET4355	AB	51° 28'	114° 54'	Boreal Plains	154	Moderately well	PICE GLA	N.T.
ESIS	34ET4356	AB	51° 38'	115° 02'	Boreal Plains	78	Moderately well	PICE GLA	N.T.
ESIS	34ET4357	AB	51° 57'	114° 53'	Boreal Plains	86	Imperfectly	PICE MAR	N.T.
ESIS	34ET4358	AB	51° 37'	115° 10'	Boreal Plains	139	Moderately well	PINU CON	N.T.
ESIS	34ET4359	AB	51° 37'	115° 10'	Boreal Plains	76	Well	POPU TRE	N.T.
ESIS	34ET4360	AB	51° 40'	115° 10'	Boreal Plains	166	Imperfectly	ABIE LAS	N.T.
ESIS	34ET4361	AB	51° 35'	114° 52'	Boreal Plains	86	Well	PICE GLA	N.T.
ESIS	34ET4363	AB	51° 31'	115° 05'	Boreal Plains	77	Moderately well	PICE ENG GLA	N.T.
ESIS	34ET4364	AB	51° 43'	114° 51'	Boreal Plains	70	Moderately well	POPU TRE	N.T.
ESIS	34ET4365	AB	51° 53'	115° 00'	Boreal Plains	91	Moderately well	PICE GLA	N.T.
ESIS	34ET4366	AB	51° 33'	115° 05'	Boreal Plains	88	Rapidly	PINU CON	N.T.
ESIS	34ET4367	AB	51° 33'	115° 03'	Boreal Plains	88	Imperfectly	PICE GLA	N.T.
ESIS	34ET4368	AB	52° 00'	114° 37'	Boreal Plains	93	Well	PICE GLA	N.T.
ESIS	34ET4369	AB	51° 39'	115° 14'	Boreal Plains	124	Moderately well	PICE GLA	N.T.
ESIS	34ET4370	AB	51° 32'	115° 06'	Boreal Plains	150	Moderately well	PINU CON	N.T.
ESIS	34ET4371	AB	51° 29'	115° 08'	Boreal Plains	178	Well	PINU CON	N.T.
ESIS	34ET4372	AB	51° 33'	115° 10'	Boreal Plains	191	Poorly	ABIE LAS	N.T.
ESIS	34ET4373	AB	51° 34'	114° 39'	Boreal Plains	71	Well	PINU CON	N.T.
ESIS	34ET4374	AB	51° 25'	115° 03'	Boreal Plains	61	Well	PINU CON	N.T.
ESIS	34ET4375	AB	51° 26'	115° 06'	Boreal Plains	52	Rapidly	PICE ENG	N.T.
ESIS	34ET4376	AB	51° 33'	115° 12'	Boreal Plains	177	Imperfectly	ABIE LAS	N.T.

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ESIS	34ET4377	AB	51° 28'	115° 09'	Boreal Plains	193	Moderately well	PINU CON	N.T.
ESIS	34ET4400	AB	51° 47'	115° 12'	Boreal Plains	106	Moderately well	PICE GLA	N.T.
ESIS	34ET4402	AB	51° 54'	115° 01'	Boreal Plains	101	Imperfectly	PICE GLA	N.T.
ESIS	34ET4403	AB	51° 49'	115° 11'	Boreal Plains	98	Moderately well	PICE GLA	N.T.
ESIS	34ET4404	AB	51° 47'	115° 12'	Boreal Plains	193	Moderately well	PINU CON	N.T.
ESIS	34ET4405	AB	51° 50'	115° 10'	Boreal Plains	96	Well	ABIE LAS	N.T.
ESIS	34ET4406	AB	51° 54'	115° 04'	Boreal Plains	77	Moderately well	PICE GLA	N.T.
ESIS	34ET4407	AB	51° 40'	115° 14'	Boreal Plains	78	Rapidly	PICE GLA	N.T.
ESIS	34ET4408	AB	51° 43'	115° 15'	Boreal Plains	180	Moderately well	ABIE LAS	N.T.
ESIS	34ET4409	AB	51° 54'	115° 04'	Boreal Plains	80	Moderately well	PICE GLA	N.T.
ESIS	34ET4410	AB	51° 36'	114° 47'	Boreal Plains	106	Moderately well	POPU BAL	N.T.
ESIS	34ET4411	AB	51° 39'	114° 41'	Boreal Plains	66	Moderately well	POPU TRE	N.T.
ESIS	34ET4412	AB	51° 39'	115° 05'	Boreal Plains	79	Well	POPU TRE	N.T.
ESIS	34ET4413	AB	51° 49'	115° 01'	Boreal Plains	95	Moderately well	ABIE LAS	N.T.
ESIS	34ET4414	AB	51° 40'	115° 07'	Boreal Plains	78	Well	POPU TRE	N.T.
ESIS	34ET4415	AB	51° 49'	114° 58'	Boreal Plains	104	Moderately well	PICE GLA	N.T.
ESIS	34ET4416	AB	51° 51'	115° 05'	Boreal Plains	88	Moderately well	PICE GLA	N.T.
ESIS	34ET4417	AB	51° 58'	115° 11'	Boreal Plains	56	Moderately well	PINU CON	N.T.
ESIS	34ET4418	AB	51° 59'	115° 14'	Boreal Plains	64	Well	PINU CON	N.T.
ESIS	34ET4419	AB	51° 38'	115° 14'	Boreal Plains	121	Well	PICE GLA	N.T.
ESIS	34ET4420	AB	51° 37'	115° 13'	Boreal Plains	102	Moderately well	POPU TRE	N.T.
ESIS	34ET4421	AB	51° 38'	115° 12'	Boreal Plains	100	Well	PINU CON	N.T.
ESIS	34ET4422	AB	51° 38'	115° 12'	Boreal Plains	71	Well	PINU CON	N.T.
ESIS	34ET4423	AB	51° 29'	115° 10'	Boreal Plains	81	Moderately well	ABIE LAS	N.T.
ESIS	34ET4424	AB	51° 30'	115° 16'	Boreal Plains	194	Well	ABIE LAS	N.T.
ESIS	34ET4427	AB	51° 46'	115° 01'	Boreal Plains	75	Moderately well	PINU CON	N.T.
ESIS	34ET4428	AB	51° 46'	115° 01'	Boreal Plains	125	Imperfectly	PINU CON	N.T.
ESIS	34ET4430	AB	51° 48'	115° 12'	Boreal Plains	89	Moderately well	PICE GLA	N.T.
ESIS	34ET4431	AB	51° 50'	115° 10'	Boreal Plains	130	Poorly	LARI LAR	N.T.
ESIS	34ET4433	AB	51° 30'	114° 45'	Boreal Plains	98	Moderately well	POPU TRE	N.T.
ESIS	34ET4435	AB	51° 29'	114° 47'	Boreal Plains	96	Well	PINU CON	N.T.
ESIS	34ET4436	AB	51° 40'	115° 14'	Boreal Plains	109	Rapidly	PICE GLA	N.T.
ESIS	34ET4437	AB	51° 40'	115° 00'	Boreal Plains	10	Very poorly	PICE MAR	N.T.
ESIS	34ET4438	AB	51° 40'	115° 01'	Boreal Plains	59	Well	PINU CON	N.T.
ESIS	34ET4439	AB	51° 36'	114° 45'	Boreal Plains	115	Rapidly	PINU CON	N.T.
ESIS	34ET4440	AB	51° 36'	114° 45'	Boreal Plains	98	Moderately well	PINU CON	N.T.
ESIS	34ET4441	AB	51° 36'	114° 47'	Boreal Plains	114	Very poorly	PICE MAR	N.T.
ESIS	34ET4442	AB	51° 35'	114° 54'	Boreal Plains	120	Imperfectly	PICE GLA	N.T.
ESIS	34ET4443	AB	51° 38'	114° 38'	Boreal Plains	63	Poorly	LARI LAR	N.T.

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ESIS	34ET4444	AB	51° 28'	114° 56'	Boreal Plains	68	Well	PINU CON	N.T.
ESIS	34ET4445	AB	51° 37'	115° 09'	Boreal Plains	82	Well	ABIE LAS	N.T.
ESIS	34ET4447	AB	51° 23'	114° 45'	Boreal Plains	89	Moderately well	POPU BAL	N.T.
ESIS	34ET4650	AB	51° 56'	114° 50'	Boreal Plains	86	Imperfectly	PICE GLA	N.T.
ESIS	34ET4659	AB	51° 40'	115° 14'	Boreal Plains	105	Moderately well	PICE ENG GLA	N.T.
ESIS	34ET4661	AB	51° 53'	114° 53'	Boreal Plains	59	Moderately well	POPU TRE	N.T.
ESIS	34ET4662	AB	51° 31'	114° 45'	Boreal Plains	132	Moderately well	PICE GLA	N.T.
ESIS	34ET4671	AB	51° 40'	115° 12'	Boreal Plains	157	Rapidly	PICE GLA	N.T.
ESIS	37BF2157	AB	53° 49'	116° 18'	Boreal Plains	92	Well	POPU TRE	PICE GLA
ESIS	37BF2172	AB	54° 06'	116° 35'	Boreal Plains	66	Well	PINU CON	PINU CON
ESIS	37CB3102	AB	53° 24'	116° 30'	Boreal Plains	119	Poorly	PICE MAR	PICE MAR
ESIS	37CB3103	AB	53° 30'	116° 30'	Boreal Plains	68	Moderately well	POPU TRE	PICE GLA
ESIS	37CB3105	AB	53° 30'	116° 33'	Boreal Plains	82	Well	POPU TRE	N.T.
ESIS	37CB3106	AB	53° 29'	116° 33'	Boreal Plains	82	Moderately well	PICE MAR	PICE MAR
ESIS	37CB3107	AB	53° 30'	116° 26'	Boreal Plains	82	Moderately well	PINU CON	PICE MAR
ESIS	37CB3108	AB	53° 35'	116° 44'	Boreal Plains	99	Moderately well	POPU TRE	PICE GLA
ESIS	37CB3109	AB	53° 27'	116° 41'	Boreal Plains	162	Poorly	PICE MAR	PICE MAR
ESIS	37CB3110	AB	53° 27'	116° 41'	Boreal Plains	76	Moderately well	PINU CON	PICE MAR
ESIS	37CB3111	AB	53° 27'	116° 45'	Boreal Plains	79	Very poorly	PICE MAR	PICE MAR
ESIS	37CB3112	AB	53° 32'	116° 48'	Boreal Plains	37	Well	POPU TRE	POPU TRE
ESIS	37KR1001	AB	57° 39'	117° 25'	Boreal Plains	70	Moderately well	PICE GLA	PICE GLA
ESIS	37KR1008	AB	57° 44'	117° 27'	Boreal Plains	60	Poorly	POPU TRE	POPU TRE
ESIS	37KR1009	AB	57° 45'	117° 33'	Boreal Plains	76	Imperfectly	POPU TRE	N.T.
ESIS	37KR1010	AB	57° 12'	117° 33'	Boreal Plains	59	Moderately well	PICE GLA	PICE GLA
ESIS	37KR1011	AB	57° 21'	117° 31'	Boreal Plains	46	Well	PINU CON	PICE GLA
ESIS	37KR1012	AB	57° 24'	117° 31'	Boreal Plains	41	Moderately well	POPU TRE	PICE MAR
ESIS	37KR1013	AB	57° 27'	117° 30'	Boreal Plains	39	Well	POPU TRE	N.T.
ESIS	37KR1015	AB	57° 45'	118° 07'	Boreal Plains	53	Imperfectly	POPU TRE	POPU BAL
ESIS	37KR1017	AB	57° 32'	117° 28'	Boreal Plains	36	Well	POPU TRE	PICE GLA
ESIS	37KR1019	AB	57° 24'	117° 30'	Boreal Plains	47	Moderately well	POPU TRE	N.T.
ESIS	37KR1020	AB	57° 44'	117° 47'	Boreal Plains	51	Imperfectly	POPU TRE	POPU TRE
ESIS	37KR1021	AB	57° 49'	117° 37'	Boreal Plains	42	Moderately well	POPU TRE	SALI BEB
ESIS	37KR1022	AB	57° 52'	117° 40'	Boreal Plains	52	Well	POPU TRE	POPU TRE
ESIS	37KR1023	AB	57° 48'	117° 40'	Boreal Plains	44	Moderately well	POPU TRE	PICE GLA
ESIS	37KR1025	AB	57° 47'	117° 53'	Boreal Plains	61	Well	PICE GLA	PICE GLA
ESIS	37KR1026	AB	57° 46'	117° 55'	Boreal Plains	72	Moderately well	PICE GLA	PICE GLA
ESIS	37KR1027	AB	57° 46'	117° 48'	Boreal Plains	102	Imperfectly	PICE GLA	PICE GLA
ESIS	37KR1028	AB	57° 47'	117° 55'	Boreal Plains	71	Imperfectly	POPU TRE	PICE GLA
ESIS	37KR1030	AB	57° 48'	117° 58'	Boreal Plains	50	Moderately well	POPU TRE	POPU TRE

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ESIS	37KR1032	AB	57° 46'	118° 08'	Boreal Plains	63	Poorly	POPU TRE	POPU TRE
ESIS	37KR1033	AB	57° 47'	118° 05'	Boreal Plains	68	Moderately well	POPU TRE	N.T.
ESIS	37KR1040	AB	57° 47'	118° 00'	Boreal Plains	40	Well	POPU BAL	ALNU TEN
ESIS	37KR1042	AB	57° 46'	118° 00'	Boreal Plains	40	Moderately well	POPU TRE	N.T.
ESIS	37KR1047	AB	57° 45'	118° 15'	Boreal Plains	35	Imperfectly	POPU TRE	POPU TRE
ESIS	37KR1051	AB	57° 46'	117° 50'	Boreal Plains	68	Imperfectly	POPU TRE	POPU TRE
ESIS	37KR1052	AB	57° 48'	117° 50'	Boreal Plains	81	Imperfectly	POPU TRE	POPU TRE
ESIS	37KR1054	AB	57° 08'	117° 37'	Boreal Plains	34	Imperfectly	POPU TRE	POPU BAL
ESIS	37KR1055	AB	57° 11'	117° 39'	Boreal Plains	110	Well	POPU TRE	POPU TRE
ESIS	37KR1056	AB	57° 10'	117° 41'	Boreal Plains	116	Moderately well	PICE GLA	PICE GLA
ESIS	37KR1057	AB	57° 11'	117° 31'	Boreal Plains	29	Moderately well	POPU TRE	POPU TRE
ESIS	37KR1058	AB	57° 11'	117° 33'	Boreal Plains	75	Moderately well	PICE GLA	PICE GLA
ESIS	37KR1059	AB	57° 13'	117° 31'	Boreal Plains	28	Imperfectly	POPU TRE	POPU TRE
ESIS	37KR1060	AB	57° 18'	117° 23'	Boreal Plains	32	Imperfectly	POPU TRE	N.T.
ESIS	37KR1061	AB	57° 11'	117° 28'	Boreal Plains	84	Poorly	PICE GLA	BETU PAP
ESIS	37KR1062	AB	57° 11'	117° 28'	Boreal Plains	24	Moderately well	POPU TRE	SALI BEB
ESIS	37KR1063	AB	57° 16'	117° 25'	Boreal Plains	24	Moderately well	POPU TRE	POPU TRE
ESIS	37KR1064	AB	57° 15'	117° 27'	Boreal Plains	34	Moderately well	POPU TRE	POPU TRE
ESIS	37KR1065	AB	57° 15'	117° 31'	Boreal Plains	36	Moderately well	POPU TRE	POPU TRE
ESIS	37KR1066	AB	57° 16'	117° 33'	Boreal Plains	31	Imperfectly	POPU TRE	POPU BAL
ESIS	37KR1068	AB	57° 18'	117° 31'	Boreal Plains	35	Imperfectly	POPU BAL	POPU BAL
ESIS	37KR1069	AB	57° 19'	117° 23'	Boreal Plains	139	Imperfectly	PICE GLA	PICE GLA
ESIS	37KR1070	AB	57° 18'	117° 25'	Boreal Plains	34	Imperfectly	PINU CON	POPU TRE
ESIS	37KR1071	AB	57° 08'	117° 31'	Boreal Plains	32	Well	POPU TRE	POPU BAL
ESIS	37KR1072	AB	57° 08'	117° 31'	Boreal Plains	28	Well	POPU TRE	POPU TRE
ESIS	37KR1073	AB	57° 10'	117° 34'	Boreal Plains	32	Well	POPU TRE	POPU TRE
ESIS	37KR1074	AB	57° 11'	117° 39'	Boreal Plains	54	Moderately well	POPU TRE	PICE GLA
ESIS	37KR1076	AB	57° 09'	117° 33'	Boreal Plains	34	Moderately well	POPU TRE	POPU TRE
ESIS	37KR1078	AB	57° 11'	117° 37'	Boreal Plains	118	Imperfectly	PICE GLA	PICE GLA
ESIS	37KR1084	AB	57° 35'	117° 30'	Boreal Plains	78	Moderately well	PICE GLA	PICE GLA
ESIS	37KR1089	AB	57° 28'	117° 33'	Boreal Plains	47	Rapidly	PINU CON	PINU CON
ESIS	37KR1095	AB	57° 35'	117° 29'	Boreal Plains	124	Moderately well	PICE MAR	PICE MAR
ESIS	37KR1108	AB	57° 52'	117° 45'	Boreal Plains	34	Moderately well	POPU TRE	POPU TRE
ESIS	37KR1109	AB	57° 51'	117° 43'	Boreal Plains	44	Moderately well	POPU TRE	POPU TRE
ESIS	37KR1116	AB	57° 54'	117° 37'	Boreal Plains	N.D.	Moderately well	POPU TRE	N.T.
ESIS	37KR1127	AB	57° 35'	117° 35'	Boreal Plains	66	Well	ABIE BAL	ABIE BAL
ESIS	37KR1130	AB	57° 39'	117° 20'	Boreal Plains	N.D.	Imperfectly	POPU BAL	N.T.
ESIS	37KR1135	AB	57° 41'	117° 50'	Boreal Plains	132	Well	PICE GLA	PICE GLA
ESIS	67BI2841	AB	57° 39'	111° 49'	Boreal Plains	116	Imperfectly	PICE GLA	PICE GLA

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ESIS	67BM1720	AB	55° 55'	119° 15'	Boreal Plains	100	Moderately well	PINU CON	PICE GLA
ESIS	67BM1721	AB	55° 50'	119° 25'	Boreal Plains	121	Moderately well	POPU TRE	PICE GLA
ESIS	67BM1722	AB	55° 50'	119° 06'	Boreal Plains	84	Moderately well	PICE GLA	PICE GLA
ESIS	67BM1723	AB	55° 50'	119° 06'	Boreal Plains	100	Imperfectly	PICE GLA	PICE GLA
ESIS	67BM1724	AB	55° 55'	119° 06'	Boreal Plains	106	Moderately well	PICE GLA	PICE GLA
ESIS	67CR1838	AB	56° 42'	110° 19'	Boreal Plains	119	Moderately well	PICE GLA	PICE GLA
ESIS	67CR1839	AB	56° 42'	110° 10'	Boreal Plains	33	Rapidly	PINU BAN	POPU TRE
ESIS	67CR1840	AB	56° 42'	110° 10'	Boreal Plains	155	Imperfectly	PICE GLA	PICE GLA
ESIS	67CR1841	AB	56° 42'	110° 10'	Boreal Plains	74	Moderately well	PICE GLA	PICE GLA
ESIS	67FB1830	AB	57° 45'	111° 19'	Boreal Plains	77	Well	PINU BAN	BETU PAP
ESIS	67FB1831	AB	57° 45'	111° 19'	Boreal Plains	61	Well	PICE GLA	PICE GLA
ESIS	67FB1832	AB	57° 45'	111° 19'	Boreal Plains	42	Moderately well	POPU TRE	POPU BAL
ESIS	67FB1833	AB	57° 45'	111° 19'	Boreal Plains	74	Well	PINU BAN	N.T.
ESIS	67FC1953	AB	54° 10'	116° 33'	Boreal Plains	145	Well	PINU CON	PICE GLA
ESIS	67FC1954	AB	54° 10'	116° 42'	Boreal Plains	91	Imperfectly	PICE GLA	PICE GLA
ESIS	67FC1955	AB	54° 10'	116° 33'	Boreal Plains	103	Imperfectly	PINU CON	PICE MAR
ESIS	67FC1956	AB	54° 10'	116° 33'	Boreal Plains	97	Well	PINU CON	PICE MAR
ESIS	67FC1958	AB	54° 20'	116° 51'	Boreal Plains	77	Poorly	PICE MAR	N.T.
ESIS	67FC1959	AB	54° 15'	116° 51'	Boreal Plains	131	Imperfectly	BETU PAP	N.T.
ESIS	67FC1960	AB	54° 10'	116° 42'	Boreal Plains	97	Imperfectly	PINU CON	PICE GLA
ESIS	67FC1962	AB	54° 20'	116° 51'	Boreal Plains	146	Poorly	PICE MAR	N.T.
ESIS	67FC1963	AB	54° 10'	116° 33'	Boreal Plains	121	Imperfectly	PICE GLA	PICE GLA
ESIS	67FC1964	AB	54° 20'	116° 42'	Boreal Plains	100	Poorly	PICE GLA	PICE GLA
ESIS	67FC1965	AB	54° 10'	116° 42'	Boreal Plains	98	Imperfectly	PINU CON	PICE MAR
ESIS	67FC1966	AB	54° 15'	116° 42'	Boreal Plains	92	Poorly	PICE MAR	PICE MAR
ESIS	67FL1729	AB	58° 37'	117° 23'	Boreal Plains	106	Moderately well	BETU PAP	PICE MAR
ESIS	67FL2742	AB	58° 32'	117° 41'	Boreal Plains	82	Imperfectly	PICE GLA	PICE GLA
ESIS	67FL2756	AB	58° 37'	117° 23'	Boreal Plains	115	Moderately well	PICE MAR	PICE MAR
ESIS	67FL2759	AB	58° 32'	116° 31'	Boreal Plains	117	Moderately well	PICE GLA	PICE GLA
ESIS	67FL3704	AB	58° 32'	117° 51'	Boreal Plains	86	Poorly	PICE MAR	PICE MAR
ESIS	67FL3705	AB	58° 32'	117° 51'	Boreal Plains	88	Well	PICE GLA	PICE GLA
ESIS	67FM1821	AB	57° 03'	111° 37'	Boreal Plains	28	Well	PINU BAN	N.T.
ESIS	67FM1836	AB	56° 42'	111° 17'	Boreal Plains	110	Moderately well	PICE GLA	PICE GLA
ESIS	67FM1837	AB	56° 47'	111° 36'	Boreal Plains	136	Well	PICE GLA	PICE GLA
ESIS	67FM2828	AB	56° 47'	111° 36'	Boreal Plains	130	Well	PICE GLA	PICE GLA
ESIS	67GP1703	AB	54° 26'	118° 00'	Boreal Plains	38	Very poorly	LARI LAR	LARI LAR
ESIS	67GP1704	AB	54° 26'	118° 00'	Boreal Plains	110	Poorly	PICE MAR	PICE MAR
ESIS	67GP2703	AB	54° 26'	118° 00'	Boreal Plains	48	Well	POPU TRE	POPU TRE
ESIS	67GP2708	AB	54° 15'	118° 18'	Boreal Plains	165	Imperfectly	PINU CON	PINU CON

Appendix 3A. Continued

Original source^a	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ESIS	**67GT2844**	**AB**	**56° 16'**	**112° 04'**	**Boreal Plains**	**82**	**Very poorly**	**PICE MAR**	**PICE MAR**
ESIS	67GT2845	AB	56° 16'	112° 04'	Boreal Plains	82	Moderately well	ABIE BAL	ABIE BAL
ESIS	**67GT2846**	**AB**	**56° 16'**	**112° 04'**	**Boreal Plains**	**109**	**Moderately well**	**POPU TRE**	**PICE GLA**
ESIS	67JL2836	AB	57° 29'	113° 45'	Boreal Plains	139	Well	POPU TRE	PICE GLA
ESIS	**67JL2837**	**AB**	**57° 29'**	**113° 45'**	**Boreal Plains**	**156**	**Well**	**PICE MAR**	**PICE MAR**
ESIS	67JT2829	AB	57° 34'	110° 10'	Boreal Plains	22	Rapidly	N.T.	PINU BAN
ESIS	**67JT2830**	**AB**	**57° 34'**	**110° 10'**	**Boreal Plains**	**106**	**N.D.**	**BETU PAP**	**BETU PAP**
ESIS	67LB1801	AB	54° 45'	111° 55'	Boreal Plains	89	Imperfectly	POPU TRE	N.T.
ESIS	**67LB1802**	**AB**	**54° 45'**	**111° 55'**	**Boreal Plains**	**N.D.**	**Well**	**POPU TRE**	**N.T.**
ESIS	67LB1803	AB	55° 23'	111° 33'	Boreal Plains	122	Poorly	PICE MAR	N.T.
ESIS	**67LB1805**	**AB**	**55° 18'**	**111° 42'**	**Boreal Plains**	**67**	**Imperfectly**	**PINU BAN**	**PICE MAR**
ESIS	67LB1806	AB	55° 18'	111° 42'	Boreal Plains	74	Well	PINU BAN	N.T.
ESIS	**67LB1807**	**AB**	**55° 18'**	**111° 51'**	**Boreal Plains**	**72**	**Well**	**PINU BAN**	**N.T.**
ESIS	67LB1809	AB	54° 47'	111° 50'	Boreal Plains	120	Poorly	PICE MAR	N.T.
ESIS	**67LB1810**	**AB**	**54° 47'**	**111° 50'**	**Boreal Plains**	**98**	**Moderately well**	**BETU PAP**	**ABIE BAL**
ESIS	67LB1811	AB	54° 52'	112° 18'	Boreal Plains	26	Imperfectly	N.T.	PICE MAR
ESIS	**67LB1813**	**AB**	**54° 47'**	**111° 50'**	**Boreal Plains**	**80**	**Moderately well**	**PICE GLA**	**PICE GLA**
ESIS	67LB2801	AB	54° 47'	111° 50'	Boreal Plains	78	Imperfectly	PICE GLA	N.T.
ESIS	**67LB2802**	**AB**	**54° 41'**	**110° 37'**	**Boreal Plains**	**98**	**Well**	**PINU BAN**	**N.T.**
ESIS	67LB2803	AB	54° 41'	110° 37'	Boreal Plains	95	Rapidly	POPU TRE	PICE GLA
ESIS	**67LB2804**	**AB**	**54° 57'**	**111° 32'**	**Boreal Plains**	**98**	**Moderately well**	**PICE GLA**	**PICE GLA**
ESIS	67LB2805	AB	54° 57'	111° 32'	Boreal Plains	102	Well	PICE GLA	PICE GLA
ESIS	**67LB2806**	**AB**	**54° 57'**	**111° 32'**	**Boreal Plains**	**43**	**Well**	**POPU TRE**	**POPU TRE**
ESIS	67LB2807	AB	54° 57'	111° 41'	Boreal Plains	49	Well	ABIE BAL	ABIE BAL
ESIS	**67LB2808**	**AB**	**54° 57'**	**111° 50'**	**Boreal Plains**	**115**	**Well**	**POPU TRE**	**PICE GLA**
ESIS	67LB2809	AB	54° 57'	111° 41'	Boreal Plains	103	N.D.	PICE GLA	PICE GLA
ESIS	**67LB2810**	**AB**	**54° 47'**	**111° 50'**	**Boreal Plains**	**88**	**Well**	**PICE GLA**	**PICE GLA**
ESIS	67LB2811	AB	54° 47'	111° 50'	Boreal Plains	45	Well	BETU PAP	BETU PAP
ESIS	**67LB2812**	**AB**	**54° 47'**	**111° 50'**	**Boreal Plains**	**87**	**Well**	**PICE GLA**	**PICE GLA**
ESIS	67ND1914	AB	52° 41'	116° 11'	Boreal Plains	121	Well	PICE GLA	PICE GLA
ESIS	**67RB1009**	**AB**	**53° 18'**	**116° 56'**	**Boreal Plains**	**78**	**Moderately well**	**PINU CON**	**PINU CON**
ESIS	67RB1010	AB	53° 18'	116° 47'	Boreal Plains	61	Imperfectly	PINU CON	PICE MAR
ESIS	**67RB1011**	**AB**	**53° 12'**	**117° 04'**	**Boreal Plains**	**175**	**Imperfectly**	**PICE ENG GLA**	**PICE ENG**
ESIS	67SH1716	AB	55° 34'	119° 33'	Boreal Plains	51	Moderately well	POPU TRE	POPU TRE
ESIS	**67SH1717**	**AB**	**55° 34'**	**119° 24'**	**Boreal Plains**	**130**	**Imperfectly**	**PICE GLA**	**PICE GLA**
ESIS	67SH1718	AB	55° 34'	119° 33'	Boreal Plains	120	Moderately well	PICE GLA	PICE GLA
ESIS	**67SH1719**	**AB**	**55° 39'**	**119° 24'**	**Boreal Plains**	**139**	**Imperfectly**	**PICE GLA**	**PICE GLA**
ESIS	67SH2730	AB	55° 34'	119° 33'	Boreal Plains	64	Moderately well	POPU TRE	POPU TRE
ESIS	**67SH2731**	**AB**	**55° 34'**	**119° 33'**	**Boreal Plains**	**101**	**Moderately well**	**PINU CON**	**PINU CON**

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ESIS	67SH2732	AB	55° 34'	119° 33'	Boreal Plains	90	Moderately well	PINU CON	PINU CON
ESIS	67SH2733	AB	55° 34'	119° 33'	Boreal Plains	40	Moderately well	POPU TRE	PICE GLA
ESIS	67SH2734	AB	55° 39'	119° 14'	Boreal Plains	131	Imperfectly	PICE GLA	PICE MAR
ESIS	67SH2735	AB	55° 39'	119° 14'	Boreal Plains	100	Well	PINU CON	PINU CON
ESIS	67SH2736	AB	55° 55'	119° 15'	Boreal Plains	96	Moderately well	PICE GLA	PICE GLA
ESIS	67SH2737	AB	55° 55'	119° 15'	Boreal Plains	71	Well	PINU CON	PICE GLA
ESIS	67SH2738	AB	55° 39'	119° 33'	Boreal Plains	76	Well	PINU CON	PINU CON
ESIS	67SL2816	AB	55° 18'	114° 46'	Boreal Plains	91	Imperfectly	PICE GLA	PICE GLA
ESIS	67SL2817	AB	55° 08'	114° 46'	Boreal Plains	69	Moderately well	PICE GLA	PICE GLA
ESIS	67SL2818	AB	55° 44'	114° 09'	Boreal Plains	114	Well	POPU TRE	PICE GLA
ESIS	67SL2819	AB	55° 39'	114° 28'	Boreal Plains	95	Moderately well	PICE GLA	PICE GLA
ESIS	67SL2820	AB	55° 08'	114° 46'	Boreal Plains	160	Well	PICE MAR	PICE MAR
ESIS	67SL2822	AB	55° 13'	114° 37'	Boreal Plains	79	Rapidly	PICE GLA	PICE GLA
ESIS	67SL2823	AB	55° 13'	114° 46'	Boreal Plains	95	Moderately well	PICE GLA	PICE GLA
ESIS	67SL2825	AB	55° 08'	116° 28'	Boreal Plains	51	Moderately well	POPU TRE	POPU TRE
ESIS	67SR1001	AB	52° 51'	115° 27'	Boreal Plains	81	Imperfectly	PICE GLA	PICE GLA
ESIS	67SR1003	AB	52° 44'	115° 27'	Boreal Plains	84	Moderately well	BETU PAP	PICE ENG
ESIS	67SR1004	AB	52° 39'	115° 24'	Boreal Plains	96	Imperfectly	PICE GLA	PICE GLA
ESIS	67SW1820	AB	54° 52'	115° 13'	Boreal Plains	120	Imperfectly	PINU CON	PICE MAR
ESIS	67SW1842	AB	54° 31'	115° 22'	Boreal Plains	101	Imperfectly	PICE GLA	ABIE BAL
ESIS	67SW1843	AB	54° 31'	115° 22'	Boreal Plains	117	Imperfectly	PICE GLA	PICE GLA
ESIS	67SW1844	AB	54° 31'	115° 22'	Boreal Plains	152	Imperfectly	PICE MAR	PICE MAR
ESIS	67SW1845	AB	54° 31'	115° 22'	Boreal Plains	83	Moderately well	PICE GLA	PICE GLA
ESIS	67SW1846	AB	54° 41'	115° 22'	Boreal Plains	118	Moderately well	PINU CON	PICE MAR
ESIS	67SW1847	AB	54° 36'	115° 31'	Boreal Plains	93	Moderately well	PICE GLA	PICE GLA
ESIS	67SW1848	AB	54° 41'	115° 31'	Boreal Plains	126	Moderately well	ABIE BAL	ABIE BAL
ESIS	67SW1849	AB	54° 41'	115° 40'	Boreal Plains	131	Moderately well	ABIE BAL	ABIE BAL
ESIS	67SW1850	AB	54° 31'	115° 22'	Boreal Plains	107	Moderately well	PICE GLA	PICE GLA
ESIS	67SW1938	AB	54° 47'	115° 59'	Boreal Plains	91	Moderately well	PINU CON	ABIE LAS
ESIS	67SW1939	AB	54° 47'	115° 59'	Boreal Plains	90	Moderately well	ABIE LAS	ABIE LAS
ESIS	67SW1944	AB	54° 26'	115° 31'	Boreal Plains	130	Moderately well	PINU CON	BETU PAP
ESIS	67SW1945	AB	54° 26'	115° 31'	Boreal Plains	125	Moderately well	PINU CON	PINU CON
ESIS	67SW2826	AB	55° 02'	115° 22'	Boreal Plains	114	Well	PICE GLA	PICE GLA
ESIS	67SW2827	AB	55° 02'	115° 22'	Boreal Plains	119	Moderately well	PICE MAR	PICE MAR
ESIS	67SW2847	AB	54° 41'	115° 22'	Boreal Plains	120	Well	PINU CON	N.T.
ESIS	67SW2848	AB	54° 41'	115° 22'	Boreal Plains	112	Imperfectly	PICE MAR	PICE MAR
ESIS	67SW2849	AB	54° 41'	115° 31'	Boreal Plains	113	Well	PINU CON	PICE MAR
ESIS	67SW2850	AB	54° 41'	115° 31'	Boreal Plains	130	Well	ABIE BAL	ABIE BAL
ESIS	67SW2851	AB	54° 41'	115° 40'	Boreal Plains	114	Well	PINU CON	PINU CON

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ESIS	**67WC1948**	**AB**	**54° 20'**	**115° 39'**	**Boreal Plains**	**138**	**Moderately well**	**PICE MAR**	**PICE MAR**
ESIS	67WC1949	AB	54° 15'	115° 39'	Boreal Plains	76	Poorly	PICE MAR	PICE MAR
ESIS	**67WC1950**	**AB**	**54° 15'**	**115° 39'**	**Boreal Plains**	**94**	**Moderately well**	**PICE GLA**	**ABIE LAS**
ESIS	67WR1814	AB	55° 39'	112° 20'	Boreal Plains	70	Moderately well	PICE MAR	PICE GLA
ESIS	**67WR1815**	**AB**	**55° 39'**	**112° 11'**	**Boreal Plains**	**77**	**Moderately well**	**PINU BAN**	**PICE GLA**
ESIS	67WR1816	AB	55° 34'	112° 20'	Boreal Plains	146	Imperfectly	ABIE BAL	ABIE BAL
ESIS	**67WR1817**	**AB**	**55° 34'**	**112° 20'**	**Boreal Plains**	**106**	**Poorly**	**PICE MAR**	**PICE MAR**
ESIS	67WR2815	AB	55° 34'	112° 20'	Boreal Plains	130	Imperfectly	PICE GLA	PICE GLA
Fyles 1986	**Site 1**	**AB**	**55°**	**114°**	**Boreal Plains**	**45**	**N.D.**	**PINU BAN**	**N.T.**
Fyles 1986	Site 2	AB	55°	114°	Boreal Plains	65	N.D.	PINU BAN	N.T.
Fyles 1986	**Site 3**	**AB**	**55°**	**114°**	**Boreal Plains**	**85**	**N.D.**	**PINU BAN**	**ALNU CRI**
Fyles 1986	Site 4	AB	55°	114°	Boreal Plains	140	N.D.	PICE GLA	PINU BAN
La Roi and Pluth 1986	**BE1**	**AB**	**54° 01'**	**116° 52'**	**Boreal Plains**	**95**	**Well**	**PINU CON**	**PICE GLA**
La Roi and Pluth 1986	BE2	AB	54° 02'	116° 57'	Boreal Plains	122	Imperfectly	PICE GLA	PICE GLA
La Roi and Pluth 1986	**BE3**	**AB**	**54° 01'**	**116° 59'**	**Boreal Plains**	**111**	**Well**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	CF11	AB	54° 34'	117° 25'	Boreal Plains	181	Moderately well	PINU CON	PICE GLA
La Roi and Pluth 1986	**CF13**	**AB**	**54° 30'**	**117° 40'**	**Boreal Plains**	**76**	**Well**	**PICE GLA**	**POPU TRE**
La Roi and Pluth 1986	CF15	AB	54° 19'	118° 22'	Boreal Plains	82	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	**CF16**	**AB**	**54° 14'**	**118° 26'**	**Boreal Plains**	**80**	**Moderately well**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	CF3	AB	54° 13'	118° 25'	Boreal Plains	104	Moderately well	PICE GLA	PICE GLA
La Roi and Pluth 1986	**CF9**	**AB**	**54° 13'**	**118° 22'**	**Boreal Plains**	**123**	**Well**	**PINU CON**	**PICE GLA**
La Roi and Pluth 1986	FC1	AB	54° 24'	116° 49'	Boreal Plains	112	Imperfectly	PICE GLA	ABIE BAL
La Roi and Pluth 1986	**FC2**	**AB**	**54° 24'**	**116° 49'**	**Boreal Plains**	**110**	**Poorly**	**PICE GLA**	**PICE GLA**
La Roi and Pluth 1986	FC3	AB	54° 23'	117° 00'	Boreal Plains	104	Poorly	PICE GLA	PICE GLA
La Roi and Pluth 1986	**FC4**	**AB**	**54° 18'**	**117° 08'**	**Boreal Plains**	**119**	**Imperfectly**	**POPU BAL**	**ABIE BAL**
La Roi and Pluth 1986	FC5	AB	54° 19'	117° 06'	Boreal Plains	90	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	**FC6**	**AB**	**54° 24'**	**116° 50'**	**Boreal Plains**	**111**	**Moderately well**	**PINU CON**	**PICE GLA**
La Roi and Pluth 1986	HC1	AB	54° 06'	116° 26'	Boreal Plains	134	Moderately well	PICE GLA	PICE GLA
La Roi and Pluth 1986	**KN1**	**AB**	**54° 19'**	**116° 37'**	**Boreal Plains**	**88**	**Poorly**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	KN10	AB	54° 08'	116° 17'	Boreal Plains	122	Imperfectly	PINU CON	PINU CON
La Roi and Pluth 1986	**KN11**	**AB**	**54° 14'**	**116° 36'**	**Boreal Plains**	**120**	**Poorly**	**PICE GLA**	**PICE GLA**
La Roi and Pluth 1986	KN12	AB	54° 12'	116° 36'	Boreal Plains	87	Very poorly	PINU CON	PINU CON
La Roi and Pluth 1986	**KN13**	**AB**	**54° 11'**	**116° 35'**	**Boreal Plains**	**89**	**Imperfectly**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	KN2	AB	54° 03'	116° 39'	Boreal Plains	86	Poorly	ABIE BAL	PICE MAR
La Roi and Pluth 1986	**KN3**	**AB**	**54° 03'**	**116° 38'**	**Boreal Plains**	**140**	**Moderately well**	**PICE GLA**	**PICE GLA**
La Roi and Pluth 1986	KN4	AB	54° 10'	116° 38'	Boreal Plains	108	Poorly	PICE GLA	PICE GLA
La Roi and Pluth 1986	**KN5**	**AB**	**54° 18'**	**116° 49'**	**Boreal Plains**	**116**	**Well**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	KN6	AB	54° 02'	116° 21'	Boreal Plains	90	Well	PINU CON	PINU CON
La Roi and Pluth 1986	**KN7**	**AB**	**54° 01'**	**116° 19'**	**Boreal Plains**	**90**	**Moderately well**	**PINU CON**	**PINU CON**

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
La Roi and Pluth 1986	KN8	AB	54° 00'	116° 20'	Boreal Plains	158	Well	PINU CON	PINU CON
La Roi and Pluth 1986	PS11	AB	54° 18'	116° 26'	Boreal Plains	106	Imperfectly	PINU CON	PICE GLA
La Roi and Pluth 1986	PS12	AB	54° 18'	116° 18'	Boreal Plains	106	Moderately well	PICE GLA	PICE GLA
La Roi and Pluth 1986	PS13	AB	54° 18'	116° 18'	Boreal Plains	105	Moderately well	PINU CON	BETU PAP
La Roi and Pluth 1986	PS14	AB	54° 19'	116° 15'	Boreal Plains	37	Moderately well	PINU CON	PICE GLA
La Roi and Pluth 1986	PS20	AB	54° 20'	116° 04'	Boreal Plains	140	Well	PINU CON	PINU CON
La Roi and Pluth 1986	PS233	AB	54° 20'	116° 04'	Boreal Plains	124	Imperfectly	PICE GLA	PICE GLA
La Roi and Pluth 1986	PS241	AB	54° 20'	116° 04'	Boreal Plains	104	Well	PINU CON	PICE GLA
La Roi and Pluth 1986	PS243	AB	54° 17'	116° 08'	Boreal Plains	87	Imperfectly	PINU CON	ALNU CRI
La Roi and Pluth 1986	PS245	AB	54° 44'	115° 41'	Boreal Plains	87	Imperfectly	PINU CON	PINU CON
La Roi and Pluth 1986	PS246	AB	54° 49'	115° 25'	Boreal Plains	86	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	PS247	AB	54° 07'	116° 45'	Boreal Plains	87	Imperfectly	PINU CON	PINU CON
La Roi and Pluth 1986	PS248	AB	54° 07'	116° 51'	Boreal Plains	84	Well	PINU CON	ALNU CRI
La Roi and Pluth 1986	PS249	AB	54° 04'	117° 02'	Boreal Plains	94	Moderately well	PINU CON	ALNU CRI
La Roi and Pluth 1986	PS257	AB	54° 04'	117° 03'	Boreal Plains	102	Poorly	PICE GLA	PICE GLA
La Roi and Pluth 1986	PS267	AB	54° 04'	117° 04'	Boreal Plains	105	Moderately well	PICE GLA	PICE GLA
La Roi and Pluth 1986	PS6	AB	54° 04'	117° 08'	Boreal Plains	105	Well	PINU CON	PICE GLA
La Roi and Pluth 1986	PS7	AB	54° 04'	117° 11'	Boreal Plains	108	Moderately well	PINU CON	BETU PAP
La Roi and Pluth 1986	PS8	AB	54° 22'	117° 04'	Boreal Plains	107	Moderately well	PINU CON	ALNU CRI
La Roi and Pluth 1986	PS9	AB	54° 37'	117° 34'	Boreal Plains	107	Moderately well	PINU CON	PICE GLA
La Roi and Pluth 1986	SA10	AB	54° 33'	117° 25'	Boreal Plains	58	Imperfectly	PINU CON	PICE MAR
La Roi and Pluth 1986	SA11	AB	54° 33'	117° 25'	Boreal Plains	58	Imperfectly	PINU CON	SALI PYR
La Roi and Pluth 1986	SA12	AB	54° 33'	117° 26'	Boreal Plains	92	Moderately well	PINU CON	PICE MAR
La Roi and Pluth 1986	SA13	AB	54° 31'	117° 30'	Boreal Plains	86	Poorly	PICE GLA	PICE MAR
La Roi and Pluth 1986	SA14	AB	54° 31'	117° 29'	Boreal Plains	110	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	SA15	AB	54° 34'	118° 09'	Boreal Plains	92	Rapidly	PINU CON	PINU CON
La Roi and Pluth 1986	SA16	AB	54° 33'	118° 09'	Boreal Plains	92	Well	PINU CON	PINU CON
La Roi and Pluth 1986	SA17	AB	54° 29'	118° 06'	Boreal Plains	175	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	SA19	AB	54° 27'	118° 04'	Boreal Plains	86	Well	PICE MAR	PICE MAR
La Roi and Pluth 1986	SA20	AB	54° 34'	118° 09'	Boreal Plains	87	Well	PICE MAR	PICE MAR
La Roi and Pluth 1986	SA21	AB	54° 31'	118° 11'	Boreal Plains	91	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	SA22	AB	54° 33'	117° 23'	Boreal Plains	90	Well	PINU CON	PICE GLA
La Roi and Pluth 1986	SA26	AB	54° 34'	118° 10'	Boreal Plains	183	Imperfectly	PINU CON	PICE MAR
La Roi and Pluth 1986	SA27	AB	54° 34'	118° 10'	Boreal Plains	200	Well	PINU CON	PICE MAR
La Roi and Pluth 1986	SA3	AB	54° 33'	117° 53'	Boreal Plains	208	Well	PICE GLA	PICE GLA
La Roi and Pluth 1986	SA4	AB	54° 32'	118° 13'	Boreal Plains	100	Poorly	PICE GLA	PICE GLA
La Roi and Pluth 1986	SA5	AB	54° 32'	118° 13'	Boreal Plains	107	Moderately well	PINU CON	PICE GLA
La Roi and Pluth 1986	SA50	AB	54° 31'	118° 12'	Boreal Plains	106	Imperfectly	PICE GLA	PICE GLA
La Roi and Pluth 1986	SA51	AB	54° 32'	118° 12'	Boreal Plains	106	Imperfectly	PICE GLA	PICE GLA

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
La Roi and Pluth 1986	**SA52**	**AB**	**54° 33'**	**117° 51'**	**Boreal Plains**	**142**	**Moderately well**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	SA53	AB	54° 34'	118° 13'	Boreal Plains	139	Moderately well	PICE MAR	PICE MAR
La Roi and Pluth 1986	**SA54**	**AB**	**54° 38'**	**115° 31'**	**Boreal Plains**	**138**	**Imperfectly**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	SA55	AB	54° 38'	115° 33'	Boreal Plains	136	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	**SA56**	**AB**	**54° 42'**	**115° 31'**	**Boreal Plains**	**138**	**Well**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	SA57	AB	54° 42'	115° 31'	Boreal Plains	140	Well	PINU CON	PINU CON
La Roi and Pluth 1986	**SA58**	**AB**	**54° 45'**	**115° 26'**	**Boreal Plains**	**143**	**Well**	**PINU CON**	**ABIE BAL**
La Roi and Pluth 1986	SA59	AB	54° 46'	115° 33'	Boreal Plains	142	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	**SA6**	**AB**	**54° 45'**	**115° 31'**	**Boreal Plains**	**106**	**Well**	**PICE GLA**	**PICE GLA**
La Roi and Pluth 1986	SA60	AB	54° 46'	115° 33'	Boreal Plains	134	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	**SA61**	**AB**	**54° 44'**	**115° 41'**	**Boreal Plains**	**144**	**Well**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	SA62	AB	54° 44'	115° 23'	Boreal Plains	138	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	**SA63**	**AB**	**54° 44'**	**115° 23'**	**Boreal Plains**	**143**	**Well**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	SA64	AB	54° 44'	115° 31'	Boreal Plains	140	Well	PINU CON	PINU CON
La Roi and Pluth 1986	**SA65**	**AB**	**54° 44'**	**115° 31'**	**Boreal Plains**	**208**	**Moderately well**	**PICE GLA**	**PICE GLA**
La Roi and Pluth 1986	SA67	AB	54° 45'	115° 30'	Boreal Plains	142	Moderately well	PINU CON	PICE MAR
La Roi and Pluth 1986	**SA68**	**AB**	**54° 44'**	**115° 31'**	**Boreal Plains**	**140**	**Moderately well**	**PINU CON**	**PICE GLA**
La Roi and Pluth 1986	SA69	AB	54° 50'	115° 25'	Boreal Plains	182	Imperfectly	PICE GLA	PICE GLA
La Roi and Pluth 1986	**SA7**	**AB**	**54° 44'**	**115° 25'**	**Boreal Plains**	**109**	**Imperfectly**	**PICE GLA**	**PICE MAR**
La Roi and Pluth 1986	SA70	AB	54° 47'	115° 31'	Boreal Plains	130	Imperfectly	PICE GLA	PICE GLA
La Roi and Pluth 1986	**SA71**	**AB**	**54° 47'**	**115° 30'**	**Boreal Plains**	**130**	**Moderately well**	**POPU TRE**	**PICE ABI**
La Roi and Pluth 1986	SA72	AB	54° 48'	115° 20'	Boreal Plains	131	Imperfectly	PICE GLA	PICE GLA
La Roi and Pluth 1986	**SA73**	**AB**	**54° 49'**	**115° 26'**	**Boreal Plains**	**111**	**Poorly**	**PICE GLA**	**PICE GLA**
La Roi and Pluth 1986	SA74	AB	54° 40'	115° 30'	Boreal Plains	108	Poorly	PICE GLA	PICE GLA
La Roi and Pluth 1986	**SA75**	**AB**	**54° 40'**	**115° 28'**	**Boreal Plains**	**106**	**Imperfectly**	**ABIE BAL**	**ABIE BAL**
La Roi and Pluth 1986	SA76	AB	54° 40'	115° 28'	Boreal Plains	112	Imperfectly	PINU CON	PICE MAR
La Roi and Pluth 1986	**SA77**	**AB**	**54° 40'**	**115° 28'**	**Boreal Plains**	**136**	**Moderately well**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	SA78	AB	54° 39'	115° 25'	Boreal Plains	104	Moderately well	PINU CON	PINU CON
La Roi and Pluth 1986	**SA79**	**AB**	**54° 44'**	**115° 22'**	**Boreal Plains**	**128**	**Imperfectly**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	SA8	AB	54° 37'	115° 34'	Boreal Plains	91	Poorly	PINU CON	SALI SCO
La Roi and Pluth 1986	**SA80**	**AB**	**54° 29'**	**115° 28'**	**Boreal Plains**	**131**	**Moderately well**	**PINU CON**	**PICE MAR**
La Roi and Pluth 1986	SA81	AB	54° 36'	115° 34'	Boreal Plains	127	Imperfectly	PICE GLA	PICE GLA
La Roi and Pluth 1986	**SA82**	**AB**	**54° 35'**	**115° 34'**	**Boreal Plains**	**130**	**Imperfectly**	**PICE GLA**	**ABIE BAL**
La Roi and Pluth 1986	SA83	AB	54° 30'	115° 25'	Boreal Plains	136	Imperfectly	PINU CON	PINU CON
La Roi and Pluth 1986	**SA84**	**AB**	**54° 30'**	**115° 25'**	**Boreal Plains**	**116**	**Well**	**PICE GLA**	**PICE GLA**
La Roi and Pluth 1986	SA85	AB	54° 34'	115° 29'	Boreal Plains	142	Well	PINU CON	PINU CON
La Roi and Pluth 1986	**SA86**	**AB**	**54° 34'**	**115° 26'**	**Boreal Plains**	**140**	**Imperfectly**	**PINU CON**	**PINU CON**
La Roi and Pluth 1986	SA9	AB	54° 34'	115° 25'	Boreal Plains	91	Rapidly	PINU CON	PINU CON
La Roi and Pluth 1986	**WF1**	**AB**	**54° 12'**	**116° 08'**	**Boreal Plains**	**110**	**Well**	**PINU CON**	**PINU CON**

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
La Roi and Pluth 1986	WF10	AB	54° 08'	116° 06'	Boreal Plains	92	Well	PINU CON	PINU CON
La Roi and Pluth 1986	WF11	AB	54° 08'	116° 06'	Boreal Plains	93	Moderately well	POPU TRE	PINU CON
La Roi and Pluth 1986	WF2	AB	54° 06'	116° 04'	Boreal Plains	105	Imperfectly	POPU TRE	PICE GLA
La Roi and Pluth 1986	WF3	AB	54° 08'	116° 13'	Boreal Plains	128	Moderately well	PICE GLA	PICE GLA
La Roi and Pluth 1986	WF4	AB	54° 08'	116° 17'	Boreal Plains	138	Imperfectly	PINU CON	PICE GLA
La Roi and Pluth 1986	WF5	AB	54° 08'	116° 08'	Boreal Plains	114	Well	ABIE BAL	ABIE BAL
La Roi and Pluth 1986	WF6	AB	54° 05'	116° 15'	Boreal Plains	56	Poorly	PICE GLA	PICE GLA
La Roi and Pluth 1986	WF7	AB	54° 05'	116° 17'	Boreal Plains	126	Poorly	PICE GLA	PICE GLA
La Roi and Pluth 1986	WF8	AB	54° 05'	116° 17'	Boreal Plains	89	Well	PINU CON	PINU CON
La Roi and Pluth 1986	WF9	AB	54° 03'	116° 16'	Boreal Plains	161	Poorly	PICE GLA	ABIE BAL
ESIS	67KT2832	AB	58° 16'	110° 10'	Boreal Shield	65	Rapidly	N.T.	PINU BAN
ESIS	67KT2833	AB	58° 16'	110° 10'	Boreal Shield	56	Rapidly	PICE MAR	PINU BAN
ESIS	67KT2834	AB	58° 16'	110° 10'	Boreal Shield	64	Rapidly	N.T.	PINU BAN
ESIS	67KT2835	AB	58° 16'	110° 10'	Boreal Shield	122	Rapidly	PINU BAN	BETU PAP
ESIS	34CB2460	AB	52° 51'	117° 03'	Montane Cordillera	161	Rapidly	N.T.	PICE ENG
ESIS	34CB2465	AB	53° 07'	117° 13'	Montane Cordillera	102	Moderately well	PICE ENG	PICE ENG
ESIS	34CB4645	AB	53° 02'	116° 56'	Montane Cordillera	70	Moderately well	PINU CON	PINU CON
ESIS	34CB8565	AB	53° 07'	117° 13'	Montane Cordillera	77	Moderately well	PINU CON	N.T.
ESIS	34CB8598	AB	52° 46'	116° 54'	Montane Cordillera	184	Well	PICE ENG	PICE ENG
ESIS	34CB8614	AB	53° 12'	117° 39'	Montane Cordillera	197	Poorly	PICE ENG	PICE ENG
ESIS	34CB8616	AB	53° 12'	117° 39'	Montane Cordillera	134	Rapidly	ABIE LAS	ABIE LAS
ESIS	34CB8621	AB	52° 46'	116° 54'	Montane Cordillera	188	Imperfectly	PICE GLA	PICE GLA
ESIS	34CB8622	AB	52° 46'	116° 45'	Montane Cordillera	184	Poorly	PICE MAR	PICE MAR
ESIS	34ET4448	AB	51° 20'	114° 44'	Montane Cordillera	76	Moderately well	POPU BAL	N.T.
ESIS	67GC3922	AB	53° 54'	119° 11'	Montane Cordillera	117	Well	PICE GLA	PICE GLA
ESIS	67HT4929	AB	53° 12'	117° 48'	Montane Cordillera	188	Well	PICE GLA	PICE GLA
ESIS	37KR1029	AB	57° 49'	117° 56'	Taiga Plains	52	Moderately well	POPU TRE	PICE GLA
ESIS	37KR1035	AB	57° 49'	118° 12'	Taiga Plains	28	Poorly	POPU TRE	POPU TRE
ESIS	37KR1036	AB	57° 49'	118° 10'	Taiga Plains	75	Imperfectly	POPU BAL	POPU BAL
ESIS	37KR1037	AB	57° 50'	118° 07'	Taiga Plains	36	Poorly	POPU BAL	ALNU TEN
ESIS	37KR1038	AB	57° 49'	118° 07'	Taiga Plains	60	Moderately well	POPU TRE	POPU TRE
ESIS	37KR1039	AB	57° 50'	117° 58'	Taiga Plains	42	Poorly	POPU TRE	POPU TRE
ESIS	37KR1045	AB	57° 51'	117° 55'	Taiga Plains	63	Moderately well	POPU TRE	POPU TRE
ESIS	37KR1046	AB	57° 51'	117° 53'	Taiga Plains	49	Imperfectly	POPU TRE	POPU TRE
ESIS	37KR1048	AB	57° 49'	118° 05'	Taiga Plains	78	Imperfectly	POPU TRE	N.T.
ESIS	37KR1136	AB	57° 56'	118° 10'	Taiga Plains	49	Poorly	PICE GLA	PICE GLA
ESIS	67FL1725	AB	58° 47'	117° 23'	Taiga Plains	153	Poorly	LARI LAR	N.T.
ESIS	67FL1726	AB	59° 03'	118° 21'	Taiga Plains	94	Very poorly	BETU PAP	BETU PAP
ESIS	67FL1727	AB	59° 03'	118° 21'	Taiga Plains	40	Poorly		PICE MAR

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ESIS	67FL1731	AB	58° 58'	117° 35'	Taiga Plains	95	Well	PINU BAN	POPU TRE
ESIS	67FL1732	AB	59° 03'	118° 00'	Taiga Plains	144	Very poorly	LARI LAR	LARI LAR
ESIS	67FL1733	AB	59° 35'	116° 56'	Taiga Plains	85	Well	PINU BAN	PINU BAN
ESIS	67FL1737	AB	59° 35'	116° 56'	Taiga Plains	104	Poorly	PICE MAR	N.T.
ESIS	67FL1738	AB	58° 58'	118° 41'	Taiga Plains	180	Poorly	LARI LAR	PICE MAR
ESIS	67FL2739	AB	59° 08'	118° 00'	Taiga Plains	134	Imperfectly	PICE GLA	PICE GLA
ESIS	67FL2740	AB	58° 11'	118° 00'	Taiga Plains	130	Well	PINU BAN	PINU BAN
ESIS	67FL2741	AB	58° 11'	118° 00'	Taiga Plains	101	Well	PINU BAN	PINU BAN
ESIS	67FL2743	AB	58° 32'	118° 10'	Taiga Plains	101	Well	POPU TRE	PICE GLA
ESIS	67FL2744	AB	58° 32'	118° 10'	Taiga Plains	95	Poorly	LARI LAR	LARI LAR
ESIS	67FL2745	AB	58° 32'	118° 10'	Taiga Plains	132	Well	PINU BAN	PINU BAN
ESIS	67FL2746	AB	58° 32'	118° 10'	Taiga Plains	77	Well	POPU TRE	PICE GLA
ESIS	67FL2747	AB	59° 14'	118° 21'	Taiga Plains	111	Imperfectly	PICE GLA	PICE GLA
ESIS	67FL2749	AB	58° 21'	118° 30'	Taiga Plains	110	Imperfectly	PICE GLA	PICE GLA
ESIS	67FL2753	AB	58° 26'	119° 20'	Taiga Plains	51	Well	PINU CON	PICE MAR
ESIS	67FL2755	AB	58° 42'	117° 13'	Taiga Plains	74	Well	PINU BAN	PICE GLA
ESIS	67FL2757	AB	59° 08'	118° 10'	Taiga Plains	95	Moderately well	PICE GLA	PICE GLA
ESIS	67FL2758	AB	59° 08'	118° 10'	Taiga Plains	143	Very poorly	PICE GLA	PICE GLA
ESIS	67FL3702	AB	59° 14'	118° 31'	Taiga Plains	117	Imperfectly	PICE GLA	PICE GLA
ESIS	67FL3703	AB	59° 14'	118° 31'	Taiga Plains	110	Moderately well	PICE MAR	PICE MAR
ESIS	67FL3706	AB	58° 37'	118° 41'	Taiga Plains	179	Well	PICE GLA	PICE GLA
ESIS	67CS1823	AB	59° 50'	110° 00'	Taiga Shield	122	Well	PINU BAN	N.T.
ESIS	67CS1824	AB	59° 50'	110° 00'	Taiga Shield	189	Well	PICE GLA	PICE MAR
ESIS	67CS1825	AB	59° 50'	110° 00'	Taiga Shield	108	Well	PINU BAN	BETU PAP
ESIS	67CS1826	AB	59° 50'	110° 00'	Taiga Shield	111	Well	PINU BAN	BETU PAP
ESIS	67CS1828	AB	59° 35'	110° 11'	Taiga Shield	58	Well	BETU PAP	BETU PAP
ESIS	67CS1829	AB	59° 35'	110° 11'	Taiga Shield	82	Well	PINU BAN	BETU PAP
ESIS	67CS1822	AB	59° 35'	110° 11'	Western Taiga Shield	110	Well	PICE MAR	PICE MAR
ARNEWS	PLOT 905	BC	49° 15'	118° 03'	Montane Cordillera	22	N.D.	PICE ENG	PICE ENG
ARNEWS	PLOT 906	BC	49° 16'	119° 45'	Montane Cordillera	69	N.D.	PSEU MEN GLA	PSEU MEN GLA
ARNEWS	PLOT 907	BC	54° 14'	122° 23'	Montane Cordillera	35	Well	ABIE LAS	ABIE LAS
ARNEWS	PLOT 915	BC	53° 03'	122° 09'	Montane Cordillera	97	Well	PICE GLA	PICE GLA
ARNEWS	PLOT 901	BC	48° 38'	123° 44'	Pacific Maritime	27	Well	N.T.	PSEU MEN
ARNEWS	PLOT 902	BC	49° 17'	122° 35'	Pacific Maritime	35	Moderately well	THUJ PLI	THUJ PLI
ARNEWS	PLOT 903	BC	48° 50'	123° 31'	Pacific Maritime	38	Moderately well	N.T.	PSEU MEN
ARNEWS	PLOT 904	BC	50° 03'	125° 21'	Pacific Maritime	34	Well	N.T.	PSEU MEN
ARNEWS	PLOT 908	BC	54° 35'	128° 34'	Pacific Maritime	44	Well	PINU CON LAT	TSUG HET
ARNEWS	PLOT 911	BC	49° 23'	123° 00'	Pacific Maritime	29	N.D.	PSEU MEN	PSEU MEN
ARNEWS	PLOT 912	BC	49° 30'	122° 58'	Pacific Maritime	14	Well	ABIE AMA	ABIE AMA

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ARNEWS	PLOT 913	BC	49° 22'	122° 45'	Pacific Maritime	34	N.D.	TSUG HET	TSUG HET
ARNEWS	PLOT 914	BC	49° 21'	122° 48'	Pacific Maritime	26	Moderately well	TSUG HET	TSUG HET
Knapik et al. 1988	Plot 12	MB	51° 58'	100° 44'	Boreal Plains	12	Rapidly	N.T.	PINU BAN
Knapik et al. 1988	Plot 13	MB	51° 53'	100° 54'	Boreal Plains	18	Poorly	N.T.	PINU BAN
Knapik et al. 1988	Plot 22	MB	51° 59'	100° 41'	Boreal Plains	81	Well	BETU PAP	N.T.
Knapik et al. 1988	Plot 23	MB	52° 05'	100° 36'	Boreal Plains	65	Well	BETU PAP	PICE GLA
Knapik et al. 1988	Plot 25	MB	52° 05'	100° 33'	Boreal Plains	85	Moderately well	POPU TRE	PINU BAN
Knapik et al. 1988	Plot 36	MB	52° 02'	100° 43'	Boreal Plains	83	Well	PICE GLA	N.T.
Knapik et al. 1988	Plot 37	MB	52° 06'	100° 35'	Boreal Plains	87	Well	POPU BAL	PICE GLA
Knapik et al. 1988	Plot 51	MB	51° 51'	100° 54'	Boreal Plains	17	Poorly	N.T.	PINU BAN
Knapik et al. 1988	Plot 52	MB	51° 52'	100° 51'	Boreal Plains	20	Imperfectly	PINU BAN	N.T.
Knapik et al. 1988	Plot 60	MB	51° 54'	100° 50'	Boreal Plains	65	Poorly	POPU BAL	N.T.
Knapik et al. 1988	Plot 66	MB	51° 54'	100° 50'	Boreal Plains	37	Moderately well	BETU PAP	N.T.
Knapik et al. 1988	Plot 7	MB	51° 54'	100° 48'	Boreal Plains	88	Well	BETU PAP	N.T.
Knapik et al. 1988	Plot 71	MB	51° 58'	100° 48'	Boreal Plains	62	Imperfectly	PICE GLA	N.T.
Knapik et al. 1988	Plot 90	MB	51° 54'	100° 46'	Boreal Plains	107	Well	POPU BAL	N.T.
Knapik et al. 1988	Plot 95	MB	52° 07'	100° 36'	Boreal Plains	76	Imperfectly	POPU TRE	N.T.
ARNEWS	PLOT 818	MB	51° 05'	96° 17'	Boreal Shield	34	N.D.	POPU TRE	POPU TRE
Halliwell and Apps 1997	MAN AIH-14 (1)	MB	55° 53'	98° 53'	Boreal Shield	44	Well	POPU TRE	POPU TRE
Halliwell and Apps 1997	MAN AIH-30 (1)	MB	55° 53'	98° 41'	Boreal Shield	33	Moderately well	POPU TRE	POPU TRE
Halliwell and Apps 1997	MAN AIM-1 (1)	MB	55° 53'	98° 29'	Boreal Shield	32	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	MAN AIM-20 (1)	MB	55° 56'	98° 38'	Boreal Shield	27	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	MAN BDH-3a (1)	MB	55° 58'	97° 29'	Boreal Shield	58	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BDH-3b (2)	MB	55° 51'	98° 02'	Boreal Shield	78	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BIH-1a (1)	MB	56° 00'	97° 20'	Boreal Shield	61	Moderately well	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BIH-1b (2)	MB	55° 55'	98° 27'	Boreal Shield	84	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BIH-1c (3)	MB	55° 55'	98° 27'	Boreal Shield	107	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BIH-9 (1)	MB	55° 50'	97° 59'	Boreal Shield	42	Well	PINU BAN	PICE MAR
Halliwell and Apps 1997	MAN BIL-2 (1)	MB	55° 50'	97° 59'	Boreal Shield	57	Very poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BIM-12a (1)	MB	55° 50'	97° 59'	Boreal Shield	132	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BIM-1a	MB	55° 55'	98° 31'	Boreal Shield	67	Well	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BIM-1b (2)	MB	55° 53'	98° 11'	Boreal Shield	64	Moderately well	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BMH-6 (1)	MB	55° 50'	97° 60'	Boreal Shield	42	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BMH-7 (1)	MB	55° 50'	97° 60'	Boreal Shield	118	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BML-21 (1)	MB	55° 50'	97° 59'	Boreal Shield	51	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BMM-8a (1)	MB	55° 55'	98° 38'	Boreal Shield	117	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN BMM-8b (2)	MB	55° 53'	98° 48'	Boreal Shield	83	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN JDH-3 (1)	MB	55° 54'	98° 14'	Boreal Shield	25	Rapidly	PINU BAN	PINU BAN
Halliwell and Apps 1997	MAN JDM-1 (1)	MB	55° 53'	98° 49'	Boreal Shield	35	Rapidly	PINU BAN	PINU BAN

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
Halliwell and Apps 1997	MAN JIH-2 (1)	MB	55° 53'	98° 49'	Boreal Shield	43	Moderately well	PINU BAN	PINU BAN
Halliwell and Apps 1997	MAN JIL-1 (1)	MB	55° 54'	98° 17'	Boreal Shield	89	Rapidly	PINU BAN	PINU BAN
Halliwell and Apps 1997	MAN JIM-4 (1)	MB	55° 54'	98° 16'	Boreal Shield	23	Rapidly	PINU BAN	PINU BAN
Halliwell and Apps 1997	MAN MW-1a (1)	MB	55° 56'	98° 36'	Boreal Shield	91	Well	PICE MAR	POPU TRE
Halliwell and Apps 1997	MAN MW-2a (1)	MB	55° 56'	98° 37'	Boreal Shield	97	N.D.	PINU BAN	POPU TRE
Halliwell and Apps 1997	MAN P-AM-1 (1)	MB	55° 54'	98° 18'	Boreal Shield	57	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	MAN P-JM-1 (1)	MB	55° 53'	98° 52'	Boreal Shield	84	Imperfectly	PINU BAN	POPU TRE
Halliwell and Apps 1997	MAN S-AD-1 (1)	MB	55° 33'	98° 03'	Boreal Shield	N.D.	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	MAN SO-M-1 (1)	MB	55° 30'	98° 05'	Boreal Shield	37	Imperfectly	PINU BAN	PINU BAN
Halliwell and Apps 1997	MAN T-AM-1 (1)	MB	55° 33'	98° 02'	Boreal Shield	83	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	MAN T-BI-1 (1)	MB	55° 55'	98° 22'	Boreal Shield	75	Imperfectly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN TE-OA (1)	MB	55° 14'	98° 24'	Boreal Shield	63	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	MAN TE-OBS (1)	MB	55° 41'	97° 54'	Boreal Shield	105	Very poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN TE-OJP (1)	MB	56° 03'	97° 04'	Boreal Shield	61	Rapidly	PINU BAN	PINU BAN
Knapik et al. 1989	Plot 8802	MB	49° 36'	98° 43'	Boreal Shield	65	Rapidly	PINU BAN	N.T.
Knapik et al. 1989	Plot 8808	MB	49° 36'	98° 50'	Boreal Shield	85	Imperfectly	POPU TRE	FRAX PEN
Knapik et al. 1989	Plot 8810	MB	49° 36'	98° 48'	Boreal Shield	92	Poorly	THUJ OCC	POPU BAL
Knapik et al. 1989	Plot 8815	MB	49° 33'	98° 46'	Boreal Shield	46	Rapidly	PINU BAN	N.T.
Knapik et al. 1989	Plot 8824	MB	49° 32'	98° 46'	Boreal Shield	109	Very poorly	PICE MAR	N.T.
Knapik et al. 1989	Plot 8829	MB	49° 26'	98° 35'	Boreal Shield	29	Rapidly	PINU BAN	N.T.
Knapik et al. 1989	Plot 8832	MB	49° 33'	98° 45'	Boreal Shield	28	Imperfectly	PINU BAN	N.T.
Knapik et al. 1989	Plot 8835	MB	49° 26'	98° 49'	Boreal Shield	53	Rapidly	PINU BAN	N.T.
Knapik et al. 1989	Plot 8836	MB	49° 26'	98° 48'	Boreal Shield	15	Rapidly	PINU BAN	N.T.
Knapik et al. 1989	Plot 8837	MB	49° 25'	98° 50'	Boreal Shield	54	Rapidly	PINU BAN	N.T.
Knapik et al. 1989	Plot 8838	MB	49° 29'	98° 49'	Boreal Shield	73	Poorly	THUJ OCC	POPU BAL
Halliwell and Apps 1997	MAN G-BI-1 (1)	MB	56° 25'	94° 16'	Hudson Plains	76	Imperfectly	PICE MAR	PICE MAR
Halliwell and Apps 1997	MAN G-BI-2 (1)	MB	56° 25'	94° 16'	Hudson Plains	68	Imperfectly	PICE MAR	PICE MAR
ARNEWS	PLOT 204	NB	46° 44'	65° 08'	Atlantic Maritime	34	Imperfectly	N.T.	PINU BAN
ARNEWS	PLOT 216	NB	47° 29'	68° 10'	Atlantic Maritime	52	N.D.	ABIE BAL	ABIE BAL
ARNEWS	PLOT 217	NB	47° 50'	67° 56'	Atlantic Maritime	40	N.D.	ABIE BAL	ABIE BAL
ARNEWS	PLOT 218	NB	47° 24'	65° 57'	Atlantic Maritime	21	N.D.	POPU TRE	POPU BAL
ARNEWS	PLOT 219	NB	45° 54'	67° 37'	Atlantic Maritime	43	N.D.	ACER SAH	ABIE BAL
ARNEWS	PLOT 224	NB	45° 38'	65° 09'	Atlantic Maritime	47	N.D.	PICE RUB	PICE RUB
ARNEWS	PLOT 209	NS	45° 35'	64° 20'	Atlantic Maritime	58	N.D.	PICE RUB	PICE RUB
ARNEWS	PLOT 210	NS	44° 17'	65° 08'	Atlantic Maritime	81	N.D.	PINU STR	PICE RUB
ARNEWS	PLOT 211	NS	44° 17'	65° 10'	Atlantic Maritime	30	N.D.	N.T.	PINU STR
ARNEWS	PLOT 212	NS	45° 58'	61° 07'	Atlantic Maritime	28	N.D.	BETU PAP	ABIE BAL
ARNEWS	PLOT 213	NS	45° 38'	61° 34'	Atlantic Maritime	48	N.D.	ABIE BAL	ABIE BAL
ARNEWS	PLOT 214	NS	45° 03'	63° 11'	Atlantic Maritime	45	Imperfectly	PICE GLA	ABIE BAL

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ARNEWS	PLOT 215	NS	45° 16'	64° 21'	Atlantic Maritime	33	N.D.	ABIE BAL	ABIE BAL
ARNEWS	**PLOT 221**	**NS**	**45° 09'**	**62° 42'**	**Atlantic Maritime**	**32**	**N.D.**	**ABIE BAL**	**ABIE BAL**
ARNEWS	PLOT 222	NS	46° 50'	60° 23'	Atlantic Maritime	44	N.D.	ACER RUB	ABIE BAL
ARNEWS	**PLOT 223**	**NS**	**44° 32'**	**65° 45'**	**Atlantic Maritime**	**60**	**N.D.**	**ACER RUB**	**ACER RUB**
Kingston et al. 1995	Dickey Lake Road	NS	45° 12'	62° 38'	Atlantic Maritime	N.D.	Moderately well	ACER SAH	BETU ALL
Kingston et al. 1995	**McIntyres Mountain**	**NS**	**45° 19'**	**62° 51'**	**Atlantic Maritime**	**N.D.**	**Imperfectly**	**ACER SAH**	**ABIE BAL**
Kingston et al. 1995	West Brook Road	NS	45° 23'	62° 55'	Atlantic Maritime	N.D.	Moderately well	PICE RUB	BETU ALL
Kingston et al. 1995	**West River Station**	**NS**	**45° 53'**	**61° 25'**	**Atlantic Maritime**	**N.D.**	**Well**	**ACER RUB**	**ACER SAH**
ARNEWS	PLOT 816	NT	60° 39'	114° 03'	Taiga Plains	73	N.D.	PICE GLA	PICE GLA
ARNEWS	**PLOT 817**	**NT**	**60° 57'**	**117° 02'**	**Taiga Plains**	**78**	**N.D.**	**PICE GLA**	**PICE GLA**
ARNEWS	PLOT 502	ON	48° 38'	89° 35'	Boreal Shield	52	N.D.	ABIE BAL	ABIE BAL
ARNEWS	**PLOT 503**	**ON**	**46° 24'**	**81° 34'**	**Boreal Shield**	**39**	**N.D.**	**ACER RUB**	**ACER SAC**
ARNEWS	PLOT 504	ON	45° 08'	78° 43'	Boreal Shield	90	N.D.	PINU STR	PINU STR
ARNEWS	**PLOT 505**	**ON**	**45° 08'**	**78° 50'**	**Boreal Shield**	**103**	**N.D.**	**ACER SAH**	**ACER SAH**
ARNEWS	PLOT 509	ON	47° 17'	83° 12'	Boreal Shield	31	N.D.	PINU BAN	PINU BAN
ARNEWS	**PLOT 510**	**ON**	**49° 48'**	**82° 17'**	**Boreal Shield**	**43**	**N.D.**	**PICE MAR**	**PICE MAR**
ARNEWS	PLOT 511	ON	48° 55'	87° 43'	Boreal Shield	56	N.D.	PICE MAR	PICE MAR
ARNEWS	**PLOT 512**	**ON**	**48° 46'**	**93° 40'**	**Boreal Shield**	**34**	**N.D.**	**PINU BAN**	**PINU BAN**
ARNEWS	PLOT 513	ON	50° 10'	91° 49'	Boreal Shield	49	N.D.	PINU BAN	PINU BAN
ARNEWS	**PLOT 514**	**ON**	**46° 00'**	**77° 27'**	**Boreal Shield**	**16**	**N.D.**	**PICE GLA**	**PICE GLA**
ARNEWS	PLOT 515	ON	46° 00'	77° 27'	Boreal Shield	17	N.D.	PICE ABI	PICE ABI
ARNEWS	**PLOT 516**	**ON**	**45° 52'**	**80° 29'**	**Boreal Shield**	**41**	**N.D.**	**POPU TRE**	**POPU TRE**
ARNEWS	PLOT 520	ON	46° 17'	78° 35'	Boreal Shield	36	N.D.	BETU PAP	BETU PAP
ARNEWS	**PLOT 521**	**ON**	**48° 26'**	**84° 31'**	**Boreal Shield**	**17**	**N.D.**	**PINU BAN**	**PINU BAN**
ARNEWS	PLOT 522	ON	49° 50'	93° 08'	Boreal Shield	24	N.D.	PINU BAN	PINU BAN
ARNEWS	**PLOT 523**	**ON**	**49° 49'**	**86° 20'**	**Boreal Shield**	**29**	**N.D.**	**ABIE BAL**	**PICE MAR**
ARNEWS	PLOT 524	ON	47° 40'	80° 00'	Boreal Shield	25	N.D.	PINU BAN	N.T.
ARNEWS	**PLOT 527**	**ON**	**45° 33'**	**78° 24'**	**Boreal Shield**	**52**	**N.D.**	**QUER RUB**	**QUER RUB**
ARNEWS	PLOT 528	ON	46° 28'	83° 23'	Boreal Shield	N.D.	N.D.	N.T.	QUER RUB
ARNEWS	**PLOT 529**	**ON**	**46° 50'**	**80° 47'**	**Boreal Shield**	**N.D.**	**N.D.**	**BETU PAP**	**BETU PAP**
ARNEWS	PLOT 530	ON	49° 04'	80° 32'	Boreal Shield	N.D.	N.D.	PICE MAR	PICE MAR
ARNEWS	**PLOT 531**	**ON**	**49° 11'**	**80° 38'**	**Boreal Shield**	**N.D.**	**N.D.**	**N.T.**	**BETU PAP**
ARNEWS	PLOT 532	ON	48° 35'	81° 08'	Boreal Shield	N.D.	N.D.	POPU TRE	POPU TRE
ARNEWS	**PLOT 533**	**ON**	**47° 34'**	**83° 37'**	**Boreal Shield**	**N.D.**	**N.D.**	**PICE GLA**	**BETU PAP**
ARNEWS	PLOT 534	ON	48° 51'	91° 16'	Boreal Shield	N.D.	N.D.	POPU TRE	POPU TRE
ARNEWS	**PLOT 535**	**ON**	**48° 46'**	**87° 11'**	**Boreal Shield**	**N.D.**	**N.D.**	**POPU TRE**	**ABIE BAL**
ARNEWS	PLOT 536	ON	49° 47'	93° 49'	Boreal Shield	N.D.	N.D.	PINU BAN	PINU BAN
ARNEWS	**PLOT 537**	**ON**	**50° 39'**	**93° 17'**	**Boreal Shield**	**N.D.**	**N.D.**	**N.T.**	**BETU PAP**
ARNEWS	PLOT 538	ON	50° 00'	94° 49'	Boreal Shield	N.D.	N.D.	POPU TRE	POPU TRE

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
ARNEWS	PLOT 506	ON	44° 32'	79° 41'	Mixedwood Plains	61	N.D.	ACER SAH	ACER SAH
ARNEWS	PLOT 507	ON	43° 51'	81° 36'	Mixedwood Plains	59	N.D.	ACER SAH	ACER SAH
ARNEWS	PLOT 508	ON	44° 37'	76° 00'	Mixedwood Plains	83	N.D.	ACER SAH	ACER SAH
ARNEWS	PLOT 517	ON	43° 42'	80° 06'	Mixedwood Plains	23	N.D.	PINU STR	PINU STR
ARNEWS	PLOT 518	ON	44° 19'	77° 23'	Mixedwood Plains	15	N.D.	PINU STR	PINU STR
ARNEWS	PLOT 519	ON	45° 20'	75° 38'	Mixedwood Plains	17	N.D.	PICE GLA	PICE GLA
ARNEWS	PLOT 525	ON	42° 22'	81° 51'	Mixedwood Plains	67	N.D.	ACER SAH	ACER SAH
ARNEWS	PLOT 526	ON	42° 42'	80° 26'	Mixedwood Plains	79	N.D.	QUER VEL	QUER ALB
ARNEWS	PLOT 220	PE	46° 29'	64° 01'	Atlantic Maritime	41	N.D.	ACER SAH	ACER SAH
ARNEWS	PLOT 313	QC	45° 02'	72° 35'	Atlantic Maritime	37	N.D.	ACER SAH	ACER SAH
ARNEWS	PLOT 315	QC	45° 34'	71° 49'	Atlantic Maritime	65	N.D.	ACER SAH	ACER RUB
ARNEWS	PLOT 319	QC	45° 24'	71° 18'	Atlantic Maritime	66	N.D.	ACER SAH	ACER SAH
ARNEWS	PLOT 320	QC	45° 24'	71° 18'	Atlantic Maritime	75	N.D.	PICE RUB	PICE RUB
ARNEWS	PLOT 321	QC	45° 24'	71° 10'	Atlantic Maritime	85	N.D.	ABIE BAL	N.T.
ARNEWS	PLOT 322	QC	45° 46'	70° 56'	Atlantic Maritime	67	N.D.	ACER SAH	ACER SAH
ARNEWS	PLOT 324	QC	48° 18'	68° 52'	Atlantic Maritime	101	N.D.	PINU RES	PINU RES
ARNEWS	PLOT 325	QC	48° 01'	67° 52'	Atlantic Maritime	51	N.D.	ABIE BAL	ABIE BAL
ARNEWS	PLOT 326	QC	48° 07'	67° 31'	Atlantic Maritime	48	N.D.	PICE MAR	PICE MAR
ARNEWS	PLOT 301	QC	46° 09'	75° 23'	Boreal Shield	42	N.D.	ACER SAH	ABIE BAL
ARNEWS	PLOT 302	QC	46° 14'	75° 16'	Boreal Shield	40	N.D.	ACER SAH	N.T.
ARNEWS	PLOT 303	QC	46° 14'	75° 16'	Boreal Shield	40	N.D.	ABIE BAL	ABIE BAL
ARNEWS	PLOT 304	QC	46° 09'	75° 08'	Boreal Shield	65	N.D.	PINU STR	PINU STR
ARNEWS	PLOT 305	QC	46° 14'	74° 37'	Boreal Shield	63	N.D.	PICE RUB	PICE RUB
ARNEWS	PLOT 306	QC	46° 14'	74° 37'	Boreal Shield	56	N.D.	BETU ALL	ABIE BAL
ARNEWS	PLOT 307	QC	45° 58'	74° 37'	Boreal Shield	64	N.D.	PICE RUB	ABIE AMA
ARNEWS	PLOT 314	QC	46° 55'	72° 07'	Boreal Shield	58	N.D.	ACER SAH	PICE RUB
ARNEWS	PLOT 316	QC	47° 39'	71° 16'	Boreal Shield	73	N.D.	ABIE BAL	ABIE BAL
ARNEWS	PLOT 317	QC	47° 39'	71° 16'	Boreal Shield	73	N.D.	PICE GLA	ABIE BAL
ARNEWS	PLOT 308	QC	45° 25'	74° 06'	Mixedwood Plains	79	N.D.	QUER RUB	QUER RUB
ARNEWS	PLOT 312	QC	45° 30'	73° 12'	Mixedwood Plains	145	N.D.	QUER RUB	ACER SAC
ARNEWS	PLOT 819	SK	53° 52'	106° 08'	Boreal Plains	63	N.D.	PICE GLA	PICE GLA
Halliwell and Apps 1997	SASK ADH-2 (1)	SK	53° 52'	106° 08'	Boreal Plains	21	Well	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK ADM-3(1)	SK	53° 44'	105° 12'	Boreal Plains	22	Well	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK AIH-3 (1)	SK	53° 38'	106° 11'	Boreal Plains	34	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK AIM-13 (1)	SK	53° 59'	105° 07'	Boreal Plains	63	Well	N.T.	POPU TRE
Halliwell and Apps 1997	SASK AMH-16 (1)	SK	53° 55'	104° 41'	Boreal Plains	36	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK AMM-12 (1)	SK	53° 39'	105° 19'	Boreal Plains	65	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK B?L (1)	SK	53° 52'	104° 38'	Boreal Plains	69	Very poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK B-AM-1 (1)	SK	53° 54'	106° 07'	Boreal Plains	43	Rapidly	POPU TRE	POPU TRE

Appendix 3A. Continued

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
Halliwell and Apps 1997	SASK BDH-4 (2)	SK	53° 53'	106° 07'	Boreal Plains	15	Very poorly	PINU BAN	PINU BAN
Halliwell and Apps 1997	SASK BDL-20 (1)	SK	53° 40'	104° 38'	Boreal Plains	120	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK BIH (1)	SK	54° 04'	104° 39'	Boreal Plains	52	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK BMH (2)	SK	53° 43'	105° 12'	Boreal Plains	137	Well	PINU BAN	PICE MAR
Halliwell and Apps 1997	SASK BMH-9 (1)	SK	53° 36'	106° 12'	Boreal Plains	54	Very poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK BMM-1b (2)	SK	53° 44'	105° 28'	Boreal Plains	90	Poorly	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK Jail House(1)	SK	53° 51'	106° 05'	Boreal Plains	88	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK JDM-8 (1)	SK	53° 54'	104° 38'	Boreal Plains	16	Rapidly	N.T.	PINU BAN
Halliwell and Apps 1997	SASK JIH-7 (1)	SK	54° 02'	104° 39'	Boreal Plains	62	Rapidly	PINU BAN	PINU BAN
Halliwell and Apps 1997	SASK JMH-10 (1)	SK	54° 00'	105° 07'	Boreal Plains	66	Rapidly	PINU BAN	PINU BAN
Halliwell and Apps 1997	SASK JMH-5 (1)	SK	53° 56'	105° 08'	Boreal Plains	98	Imperfectly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK JMH-A1 (1)	SK	53° 56'	105° 08'	Boreal Plains	82	Moderately well	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK JMH-A2 (2)	SK	53° 57'	104° 46'	Boreal Plains	144	Well	PICE MAR	PINU BAN
Halliwell and Apps 1997	SASK JMM-5 (1)	SK	53° 39'	105° 18'	Boreal Plains	112	Rapidly	PINU BAN	PINU BAN
Halliwell and Apps 1997	SASK JMM-6 (1)	SK	53° 48'	104° 32'	Boreal Plains	68	Rapidly	PINU BAN	PINU BAN
Halliwell and Apps 1997	SASK JMM-8a (1)	SK	53° 58'	104° 38'	Boreal Plains	64	Rapidly	PINU BAN	PINU BAN
Halliwell and Apps 1997	SASK JMM-8b (2)	SK	54° 07'	105° 03'	Boreal Plains	67	Rapidly	N.T.	PINU BAN
Halliwell and Apps 1997	SASK M-BD-1 (1)	SK	53° 53'	105° 04'	Boreal Plains	48	Very poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK MW-1a (1)	SK	53° 59'	104° 44'	Boreal Plains	102	Well	PICE GLA	POPU TRE
Halliwell and Apps 1997	SASK MW-1b (2)	SK	53° 53'	105° 02'	Boreal Plains	106	Imperfectly	PICE GLA	PICE GLA
Halliwell and Apps 1997	SASK NI-J-1 (1)	SK	53° 53'	105° 02'	Boreal Plains	38	Rapidly	PINU BAN	PINU BAN
Halliwell and Apps 1997	SASK PA-BM-1(1)	SK	53° 55'	104° 46'	Boreal Plains	84	Imperfectly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK PA-M-1 (1)	SK	53° 55'	104° 45'	Boreal Plains	76	Imperfectly	PICE GLA	PICE GLA
Halliwell and Apps 1997	SASK PA-M-2 (1)	SK	53° 57'	104° 46'	Boreal Plains	56	Well	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK POM-MW (1)	SK	53° 58'	104° 46'	Boreal Plains	52	Moderately well	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK POM-OBS (1)	SK	53° 57'	105° 09'	Boreal Plains	68	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK POM-OJP(1)	SK	53° 57'	105° 09'	Boreal Plains	64	Well	PINU BAN	PINU BAN
Halliwell and Apps 1997	SASK TE MW (1)	SK	52° 44'	106° 08'	Boreal Plains	42	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK TE-OA (1)	SK	54° 03'	105° 44'	Boreal Plains	52	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK TE-OBS (1)	SK	53° 12'	106° 14'	Boreal Plains	91	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK TE-OJP (1)	SK	54° 04'	105° 56'	Boreal Plains	62	Moderately well	PINU BAN	PINU BAN
Halliwell and Apps 1997	SASK TF-YA (1)	SK	54° 04'	105° 56'	Boreal Plains	11	Imperfectly	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK TF-YJP (1)	SK	54° 04'	105° 56'	Boreal Plains	19	Moderately well	PINU BAN	PINU BAN
Halliwell and Apps 1997	SASK F-AM-1 (1)	SK	55° 26'	102° 20'	Boreal Shield	56	Well	POPU TRE	POPU TRE
Halliwell and Apps 1997	SASK F-BD-1 (1)	SK	55° 13'	102° 49'	Boreal Shield	37	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK F-BI-1 (1)	SK	55° 26'	102° 26'	Boreal Shield	52	Well	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK F-BM-1 (1)	SK	55° 13'	102° 53'	Boreal Shield	65	Poorly	PICE MAR	PICE MAR
Halliwell and Apps 1997	SASK F-BM-2 (1)	SK	55° 13'	102° 51'	Boreal Shield	46	Rapidly	PINU BAN	PICE MAR
Halliwell and Apps 1997	SASK F-BM-3 (1)	SK	55° 25'	102° 23'	Boreal Shield	61	Imperfectly	PICE MAR	PICE MAR

Appendix 3A. Concluded

Original source[a]	Original source ID	Province or territory	Latitude	Longitude	Terrestrial ecozone	Stand age	Drainage class	Dominant species 1	Codominant species 1
Halliwell and Apps 1997	**SASK F-JD-1 (1)**	**SK**	**55° 13'**	**102° 54'**	**Boreal Shield**	**13**	**Moderately well**	**PINU BAN**	**PINU BAN**
Halliwell and Apps 1997	SASK F-JM-1 (1)	SK	55° 13'	102° 53'	Boreal Shield	110	Imperfectly	PICE MAR	PINU BAN
Halliwell and Apps 1997	**SASK F-JM-2 (1)**	**SK**	**55° 13'**	**102° 53'**	**Boreal Shield**	**121**	**Rapidly**	**PINU BAN**	**PINU BAN**
Halliwell and Apps 1997	SASK F-JM-4 (1)	SK	55° 27'	102° 19'	Boreal Shield	51	Rapidly	PICE MAR	PINU BAN
Halliwell and Apps 1997	**SASK F-JM-5 (1)**	**SK**	**55° 26'**	**102° 20'**	**Boreal Shield**	**55**	**Well**	**PICE MAR**	**PICE MAR**
Halliwell and Apps 1997	SASK F-M-1 (1)	SK	55° 27'	102° 19'	Boreal Shield	91	Imperfectly	PINU BAN	PINU BAN

[a] ARNEWS = Acid Rain Early Warning System (D'Eon 1994), ESIS = Alberta Ecological Sita Data (Resource Data Branch 2002).

[b] N.D. = no data.

[c] N.T. = no trees in this layer.

Appendix 3B. Summary of soil, aboveground live tree and total ecosystem carbon stocks (t ha^{-1}), sorted alphabetically by province or territory and terrestrial ecozone (same order as Appendix 3A)

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ARNEWS	PLOT 820	95	40	135	35	7	5	3	50	185
ESIS	34CB2457	75	44	119	77	11	13	12	113	232
ESIS	34CB2462	161	15	176	34	5	9	7	56	232
ESIS	34CB2466	54	20	75	59	6	7	7	79	154
ESIS	34CB2467	101	47	148	79	8	9	8	104	252
ESIS	34CB4475	55	14	69	174	38	30	6	249	318
ESIS	34CB4476	0	893	893	45	5	4	8	61	954
ESIS	34CB4477	38	35	72	168	31	24	16	239	311
ESIS	34CB4478	0	582	582	28	4	6	5	42	624
ESIS	34CB4479	50	304	354	11	1	1	2	16	370
ESIS	34CB4480	44	34	78	61	8	7	9	85	163
ESIS	34CB4481	0	873	873	23	3	5	3	34	907
ESIS	34CB4482	51	39	90	83	17	15	3	118	208
ESIS	34CB4483	51	5	56	10	2	1	2	14	70
ESIS	34CB4484	133	305	438	37	4	3	7	51	489
ESIS	34CB4485	53	29	82	60	10	9	4	82	164
ESIS	34CB4487	0	568	568	1	0	0	0	2	570
ESIS	34CB4488	202	0	202	14	3	2	2	21	223
ESIS	34CB4489	0	773	773	19	2	2	3	26	799
ESIS	34CB4490	72	80	152	76	8	7	12	102	254
ESIS	34CB4637	83	52	135	80	14	12	5	110	245
ESIS	34CB4652	0	756	756	1	0	0	0	2	758
ESIS	34CB4653	19	16	35	18	2	2	2	23	58
ESIS	34CB4655	73	34	107	101	10	11	10	131	238
ESIS	34CB8558	140	59	200	106	11	12	11	139	339
ESIS	34CB8559	300	35	334	79	11	11	10	111	445
ESIS	34CB8563	115	60	175	58	6	7	6	77	252
ESIS	34CB8564	107	87	194	86	9	10	9	113	307
ESIS	34CB8566	99	103	202	103	18	15	6	142	344
ESIS	34CB8571	151	36	187	89	14	9	18	130	317
ESIS	34CB8574	46	29	76	77	8	9	8	102	178
ESIS	34CB8575	73	22	96	133	29	23	5	189	285
ESIS	34CB8577	66	27	94	93	20	16	3	132	226
ESIS	34CB8578	48	11	58	71	12	10	4	98	156
ESIS	34CB8579	56	51	106	92	14	13	7	125	231
ESIS	34CB8580	58	18	75	73	7	8	7	96	171
ESIS	34CB8583	63	32	96	63	6	7	6	82	178

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ESIS	34CB8584	370	40	409	14	1	1	3	18	427
ESIS	34CB8591	59	21	80	20	2	3	3	28	108
ESIS	34CB8592	46	46	91	54	5	6	5	71	162
ESIS	34CB8593	86	44	130	70	7	12	8	97	227
ESIS	34CB8602	72	36	108	53	6	6	6	71	179
ESIS	34CB8607	574	156	730	103	14	9	19	145	875
ESIS	34CB8617	64	14	78	36	4	4	5	48	126
ESIS	34CB8618	125	66	191	86	15	13	5	119	310
ESIS	34CB8619	134	20	154	72	7	8	7	94	248
ESIS	34CB8620	95	51	147	43	5	5	5	57	204
ESIS	34CB8624	77	42	120	68	7	8	7	89	209
ESIS	34CB8652	57	0	57	40	4	5	5	54	111
ESIS	34CB8654	81	10	92	63	6	7	7	83	175
ESIS	34ET4350	107	16	124	68	7	8	7	90	214
ESIS	34ET4351	86	15	100	51	5	6	5	67	167
ESIS	34ET4352	203	43	246	86	9	10	8	112	358
ESIS	34ET4353	57	30	87	62	7	6	10	86	173
ESIS	34ET4354	125	30	154	55	6	6	7	73	227
ESIS	34ET4355	102	81	183	38	6	4	8	56	239
ESIS	34ET4356	141	22	163	69	13	12	3	97	260
ESIS	34ET4357	79	50	129	96	10	10	11	126	255
ESIS	34ET4358	112	29	142	118	18	12	22	170	312
ESIS	34ET4359	173	27	200	32	7	6	1	45	245
ESIS	34ET4360	146	41	187	118	15	12	17	162	349
ESIS	34ET4361	82	24	105	74	8	8	7	97	202
ESIS	34ET4363	105	45	151	37	4	4	4	49	200
ESIS	34ET4364	108	18	126	44	8	5	7	64	190
ESIS	34ET4365	58	25	83	80	8	9	9	105	188
ESIS	34ET4366	46	42	88	24	3	3	3	32	120
ESIS	34ET4367	61	23	84	71	7	8	8	94	178
ESIS	34ET4368	108	24	131	61	13	11	2	87	218
ESIS	34ET4369	125	9	134	100	10	11	11	131	265
ESIS	34ET4370	95	20	114	43	7	8	9	66	180
ESIS	34ET4371	109	41	149	35	5	5	7	51	200
ESIS	34ET4372	376	53	429	43	7	5	9	64	493
ESIS	34ET4373	60	25	86	39	8	6	3	57	143
ESIS	34ET4374	108	15	124	41	4	5	6	56	180
ESIS	34ET4375	160	17	176	47	5	6	6	63	239
ESIS	34ET4376	170	52	222	37	6	4	8	56	278

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ESIS	34ET4377	82	72	154	45	7	5	9	66	220
ESIS	34ET4400	209	13	222	78	12	8	15	113	335
ESIS	34ET4402	92	9	101	70	15	11	5	101	202
ESIS	34ET4403	72	24	96	33	3	4	4	44	140
ESIS	34ET4404	124	22	146	65	7	6	11	89	235
ESIS	34ET4405	80	15	95	72	7	8	8	94	189
ESIS	34ET4406	109	38	147	109	17	12	16	154	301
ESIS	34ET4407	136	23	159	74	8	8	10	100	259
ESIS	34ET4408	95	29	124	74	12	7	15	108	232
ESIS	34ET4409	84	29	113	96	21	17	3	137	250
ESIS	34ET4410	77	10	87	47	7	6	4	64	151
ESIS	34ET4411	106	27	133	45	10	8	2	65	198
ESIS	34ET4412	303	37	340	80	10	9	12	111	451
ESIS	34ET4413	70	12	82	101	10	11	11	134	216
ESIS	34ET4414	175	22	197	60	13	10	2	86	283
ESIS	34ET4415	71	55	126	129	20	13	24	186	312
ESIS	34ET4416	124	14	138	156	18	19	16	208	346
ESIS	34ET4417	70	21	91	99	10	11	11	131	222
ESIS	34ET4418	237	24	261	31	7	5	1	45	306
ESIS	34ET4419	157	41	198	63	7	7	8	84	282
ESIS	34ET4420	192	23	215	55	12	10	2	79	294
ESIS	34ET4421	113	9	122	17	2	2	2	22	144
ESIS	34ET4422	59	6	65	43	4	5	5	57	122
ESIS	34ET4423	96	21	117	50	5	6	5	66	183
ESIS	34ET4424	111	43	154	30	5	4	7	45	199
ESIS	34ET4427	84	11	96	61	6	7	6	80	176
ESIS	34ET4428	96	21	117	71	7	6	12	96	213
ESIS	34ET4430	120	22	142	87	13	9	16	124	266
ESIS	34ET4431	99	270	369	12	1	1	2	16	385
ESIS	34ET4433	79	42	122	47	8	6	5	67	189
ESIS	34ET4435	89	24	113	31	5	3	7	46	159
ESIS	34ET4436	66	4	70	28	3	3	4	38	108
ESIS	34ET4437	0	992	992	8	1	1	2	11	1003
ESIS	34ET4438	107	2	109	19	2	2	2	25	134
ESIS	34ET4439	88	3	91	24	3	3	3	33	124
ESIS	34ET4440	81	22	102	188	33	25	19	266	368
ESIS	34ET4441	0	219	219	10	1	1	2	14	233
ESIS	34ET4442	110	28	138	102	10	11	12	134	272
ESIS	34ET4443	0	519	519	7	1	1	1	10	529

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ESIS	34ET4444	70	10	80	45	5	5	5	60	140
ESIS	34ET4445	125	66	191	31	4	4	5	43	234
ESIS	34ET4447	110	21	131	52	10	10	2	74	205
ESIS	34ET4650	80	13	93	33	7	6	2	47	140
ESIS	34ET4659	83	9	92	42	4	5	4	55	147
ESIS	34ET4661	63	22	85	52	12	9	2	75	160
ESIS	34ET4662	59	22	82	81	8	10	8	107	189
ESIS	34ET4671	92	4	96	22	3	2	5	32	128
ESIS	37BF2157	88	24	112	68	13	11	4	96	208
ESIS	37BF2172	40	14	54	76	8	8	7	99	153
ESIS	37CB3102	148	37	185	59	7	7	8	81	266
ESIS	37CB3103	110	42	152	69	15	12	3	98	250
ESIS	37CB3105	219	37	256	115	25	20	4	164	420
ESIS	37CB3106	77	33	110	93	9	9	11	123	233
ESIS	37CB3107	108	20	129	74	7	8	9	97	226
ESIS	37CB3108	131	20	151	117	25	20	5	167	318
ESIS	37CB3109	113	48	161	55	6	4	10	75	236
ESIS	37CB3110	104	18	122	79	8	9	8	104	226
ESIS	37CB3111	79	65	143	46	5	4	8	63	206
ESIS	37CB3112	87	40	127	15	3	3	1	22	149
ESIS	37KR1001	37	47	84	64	8	7	9	88	172
ESIS	37KR1008	67	19	86	51	11	9	2	73	159
ESIS	37KR1009	45	12	57	47	10	8	2	66	123
ESIS	37KR1010	73	39	112	109	17	11	22	159	271
ESIS	37KR1011	44	17	61	38	4	4	5	51	112
ESIS	37KR1012	40	13	53	16	3	3	1	22	75
ESIS	37KR1013	43	26	69	43	10	7	2	62	131
ESIS	37KR1015	162	51	213	46	9	9	1	65	278
ESIS	37KR1017	87	22	109	16	4	3	1	23	132
ESIS	37KR1019	37	44	80	81	14	17	2	115	195
ESIS	37KR1020	95	9	104	66	14	11	3	94	198
ESIS	37KR1021	85	11	96	22	5	4	1	32	128
ESIS	37KR1022	56	19	75	39	9	7	1	55	130
ESIS	37KR1023	88	30	118	35	8	6	1	50	168
ESIS	37KR1025	66	45	111	69	11	7	14	100	211
ESIS	37KR1026	106	9	114	89	14	9	18	130	244
ESIS	37KR1027	201	170	372	118	18	12	23	171	543
ESIS	37KR1028	197	44	241	80	18	14	3	114	355
ESIS	37KR1030	61	43	105	60	13	10	2	86	191

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ESIS	37KR1032	41	19	60	66	15	11	2	95	155
ESIS	37KR1033	45	19	65	68	15	12	2	96	161
ESIS	37KR1040	81	6	87	41	6	10	1	58	145
ESIS	37KR1042	154	19	173	90	20	16	3	129	302
ESIS	37KR1047	59	14	73	7	2	1	0	10	83
ESIS	37KR1051	120	18	138	101	22	18	4	143	281
ESIS	37KR1052	146	26	172	151	32	27	5	214	386
ESIS	37KR1054	77	36	113	16	3	3	1	22	135
ESIS	37KR1055	45	26	71	84	18	14	3	119	190
ESIS	37KR1056	62	29	91	81	16	12	8	116	207
ESIS	37KR1057	81	48	130	25	6	4	1	35	165
ESIS	37KR1058	83	41	123	60	11	8	8	88	211
ESIS	37KR1059	75	51	127	10	2	2	0	15	142
ESIS	37KR1060	110	51	161	12	3	2	1	18	179
ESIS	37KR1061	125	28	153	53	9	6	9	77	230
ESIS	37KR1062	115	20	135	11	3	2	0	16	151
ESIS	37KR1063	108	25	133	12	3	2	0	16	149
ESIS	37KR1064	54	20	74	9	2	2	0	13	87
ESIS	37KR1065	74	19	93	32	7	6	1	46	139
ESIS	37KR1066	68	9	77	15	3	3	1	21	98
ESIS	37KR1068	94	9	103	27	5	5	1	38	141
ESIS	37KR1069	77	64	141	51	9	6	8	74	215
ESIS	37KR1070	68	23	92	42	5	5	5	57	149
ESIS	37KR1071	35	15	50	36	7	7	1	50	100
ESIS	37KR1072	88	34	122	26	6	5	1	37	159
ESIS	37KR1073	77	19	96	16	4	3	1	23	119
ESIS	37KR1074	61	24	85	18	4	3	1	26	111
ESIS	37KR1076	88	58	146	35	8	6	1	50	196
ESIS	37KR1078	67	25	92	69	12	8	11	100	192
ESIS	37KR1084	102	59	161	126	20	12	26	184	345
ESIS	37KR1089	29	41	70	57	6	7	7	76	146
ESIS	37KR1095	75	68	143	119	13	10	21	162	305
ESIS	37KR1108	68	22	90	27	6	5	1	38	128
ESIS	37KR1109	76	16	92	17	4	3	1	25	117
ESIS	37KR1116	69	11	79	20	5	4	1	29	108
ESIS	37KR1127	51	47	98	56	10	10	11	86	184
ESIS	37KR1130	92	57	149	99	18	20	3	140	289
ESIS	37KR1135	49	31	80	89	12	9	14	123	203
ESIS	67BI2841	68	53	121	126	20	13	24	182	303

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ESIS	67BM1720	115	55	170	160	22	17	25	224	394
ESIS	67BM1721	109	107	216	118	24	18	10	170	386
ESIS	67BM1722	136	104	239	75	12	8	15	109	348
ESIS	67BM1723	123	54	178	61	10	8	9	88	266
ESIS	67BM1724	165	80	245	143	23	15	27	207	452
ESIS	67CR1838	99	89	188	201	31	29	28	288	476
ESIS	67CR1839	34	0	34	12	2	3	2	19	53
ESIS	67CR1840	51	101	152	122	19	12	24	177	329
ESIS	67CR1841	74	65	139	61	10	7	11	89	228
ESIS	67FB1830	32	16	48	46	5	5	2	57	105
ESIS	67FB1831	18	2	19	185	27	19	29	260	279
ESIS	67FB1832	86	16	102	93	20	16	3	132	234
ESIS	67FB1833	81	13	94	49	6	8	4	67	161
ESIS	67FC1953	21	24	45	80	8	9	8	104	149
ESIS	67FC1954	110	43	154	107	15	13	18	153	307
ESIS	67FC1955	53	41	94	135	15	15	15	180	274
ESIS	67FC1956	29	60	89	130	13	14	14	171	260
ESIS	67FC1958	0	997	997	41	4	3	7	55	1052
ESIS	67FC1959	79	26	105	39	7	6	2	53	158
ESIS	67FC1960	51	38	89	142	16	17	14	189	278
ESIS	67FC1962	30	385	415	146	18	13	26	203	618
ESIS	67FC1963	111	92	203	156	26	17	27	226	429
ESIS	67FC1964	49	283	332	118	18	12	24	172	504
ESIS	67FC1965	49	0	49	161	16	16	18	211	260
ESIS	67FC1966	0	575	575	87	9	8	15	118	693
ESIS	67FL1729	163	87	250	47	6	6	6	64	314
ESIS	67FL2742	107	68	175	84	13	8	17	122	297
ESIS	67FL2756	195	103	298	28	3	3	6	39	337
ESIS	67FL2759	35	189	225	33	5	4	8	49	274
ESIS	67FL3704	0	903	903	12	1	1	2	17	920
ESIS	67FL3705	127	150	277	87	12	10	13	121	398
ESIS	67FM1821	65	6	71	18	3	4	2	26	97
ESIS	67FM1836	145	54	199	85	14	10	14	123	322
ESIS	67FM1837	102	46	148	198	32	20	37	287	435
ESIS	67FM2828	40	85	125	91	15	10	16	131	256
ESIS	67GP1703	38	350	388	29	4	7	5	44	432
ESIS	67GP1704	282	297	580	87	11	8	17	123	703
ESIS	67GP2703	93	42	135	95	21	16	3	135	270
ESIS	67GP2708	61	46	107	73	7	8	8	96	203

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ESIS	67GT2844	192	343	535	38	4	3	7	51	586
ESIS	67GT2845	86	59	145	76	12	10	15	113	258
ESIS	67GT2846	98	35	134	225	47	37	13	322	456
ESIS	67JL2836	56	50	105	131	26	19	12	188	293
ESIS	67JL2837	59	95	154	128	14	10	23	175	329
ESIS	67JT2829	31	0	31	8	2	3	1	13	44
ESIS	67JT2830	131	18	149	39	6	5	3	53	202
ESIS	67LB1801	28	24	51	207	30	30	10	277	328
ESIS	67LB1802	46	27	74	16	3	3	1	22	96
ESIS	67LB1803	344	440	783	16	2	2	3	22	805
ESIS	67LB1805	4	16	21	28	4	4	3	38	59
ESIS	67LB1806	75	25	100	29	4	4	2	38	138
ESIS	67LB1807	77	8	85	39	5	6	3	52	137
ESIS	67LB1809	0	475	475	25	3	2	5	34	509
ESIS	67LB1810	98	51	148	70	12	13	6	101	249
ESIS	67LB1811	0	518	518	4	0	0	1	5	523
ESIS	67LB1813	82	26	108	57	9	6	11	82	190
ESIS	67LB2801	83	68	151	87	13	12	14	125	276
ESIS	67LB2802	26	8	34	60	6	8	4	78	112
ESIS	67LB2803	42	12	54	39	9	7	2	55	109
ESIS	67LB2804	51	44	95	82	15	11	10	117	212
ESIS	67LB2805	52	44	95	114	21	15	14	164	259
ESIS	67LB2806	58	12	69	40	9	7	1	57	126
ESIS	67LB2807	55	42	98	49	9	14	7	79	177
ESIS	67LB2808	36	41	77	47	7	7	7	68	145
ESIS	67LB2809	0	280	280	124	20	14	22	179	459
ESIS	67LB2810	120	63	183	115	17	11	23	166	349
ESIS	67LB2811	91	20	111	56	10	9	2	77	188
ESIS	67LB2812	51	28	79	83	13	9	15	121	200
ESIS	67ND1914	193	31	224	138	20	14	25	197	421
ESIS	67RB1009	76	46	122	89	9	10	9	117	239
ESIS	67RB1010	48	64	112	39	4	4	7	54	166
ESIS	67RB1011	352	26	378	109	11	14	9	143	521
ESIS	67SH1716	57	71	128	47	10	8	2	67	195
ESIS	67SH1717	132	55	187	88	14	12	13	127	314
ESIS	67SH1718	116	15	131	90	16	11	15	131	262
ESIS	67SH1719	404	27	430	157	24	15	31	227	657
ESIS	67SH2730	92	60	152	79	17	14	3	113	265
ESIS	67SH2731	70	26	95	205	25	25	21	276	371

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ESIS	67SH2732	85	20	105	73	8	8	8	96	201
ESIS	67SH2733	88	30	119	30	6	5	2	44	163
ESIS	67SH2734	106	431	537	57	8	10	5	79	616
ESIS	67SH2735	51	19	69	201	20	22	19	262	331
ESIS	67SH2736	119	97	216	158	24	21	24	227	443
ESIS	67SH2737	113	27	140	86	10	10	10	115	255
ESIS	67SH2738	95	16	110	81	8	9	8	106	216
ESIS	67SL2816	183	29	211	86	13	8	17	125	336
ESIS	67SL2817	70	57	127	130	20	13	26	189	316
ESIS	67SL2818	50	72	122	121	20	13	23	177	299
ESIS	67SL2819	117	73	190	130	21	19	17	186	376
ESIS	67SL2820	51	57	108	84	9	8	12	113	221
ESIS	67SL2822	62	27	89	57	9	6	11	83	172
ESIS	67SL2823	45	33	78	125	21	16	19	181	259
ESIS	67SL2825	55	38	93	52	12	9	2	75	168
ESIS	67SR1001	136	101	237	150	23	15	30	217	454
ESIS	67SR1003	85	43	127	92	15	12	12	130	257
ESIS	67SR1004	101	58	159	114	18	11	23	166	325
ESIS	67SW1820	34	41	74	94	9	10	10	123	197
ESIS	67SW1842	71	72	143	83	13	9	16	121	264
ESIS	67SW1843	109	41	150	77	11	7	15	110	260
ESIS	67SW1844	71	41	112	106	11	8	19	145	257
ESIS	67SW1845	110	17	128	97	16	10	17	140	268
ESIS	67SW1846	67	73	140	75	8	8	8	99	239
ESIS	67SW1847	107	85	192	180	28	19	34	261	453
ESIS	67SW1848	62	58	120	43	7	11	7	69	189
ESIS	67SW1849	103	64	167	50	8	11	8	78	245
ESIS	67SW1850	50	42	92	69	10	7	14	100	192
ESIS	67SW1938	84	39	123	83	10	17	14	124	247
ESIS	67SW1939	99	44	143	64	10	23	16	112	255
ESIS	67SW1944	67	29	96	197	20	22	19	257	353
ESIS	67SW1945	59	57	116	72	7	8	7	94	210
ESIS	67SW2826	261	33	295	205	31	35	22	293	588
ESIS	67SW2827	43	45	87	80	10	9	11	110	197
ESIS	67SW2847	58	41	100	83	10	11	9	113	213
ESIS	67SW2848	194	41	235	64	7	5	12	87	322
ESIS	67SW2849	44	31	75	48	5	6	7	65	140
ESIS	67SW2850	70	41	111	36	6	12	8	61	172
ESIS	67SW2851	117	29	146	57	6	6	8	78	224

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ESIS	67WC1948	41	47	87	71	8	8	12	98	185
ESIS	67WC1949	73	230	302	46	5	4	9	63	365
ESIS	67WC1950	81	51	131	93	16	11	15	135	266
ESIS	67WR1814	33	19	51	55	6	7	3	70	121
ESIS	67WR1815	19	26	45	64	6	7	3	80	125
ESIS	67WR1816	49	466	515	110	19	16	19	163	678
ESIS	67WR1817	43	44	87	67	7	6	11	91	178
ESIS	67WR2815	41	108	149	63	9	7	12	91	240
Fyles 1986	Site 1	32	21	53	14	2	3	1	20	73
Fyles 1986	Site 2	40	10	50	34	4	4	2	44	94
Fyles 1986	Site 3	46	18	63	68	7	6	3	84	147
Fyles 1986	Site 4	79	37	116	72	11	9	13	105	221
La Roi and Pluth 1986	BE1	25	9	34	61	7	7	6	80	114
La Roi and Pluth 1986	BE2	565	138	704	151	24	16	28	219	923
La Roi and Pluth 1986	BE3	48	7	55	54	6	6	5	71	126
La Roi and Pluth 1986	CF11	184	27	211	139	17	14	19	188	399
La Roi and Pluth 1986	CF13	182	31	213	54	7	7	6	74	287
La Roi and Pluth 1986	CF15	85	20	105	78	8	9	8	102	207
La Roi and Pluth 1986	CF16	168	10	178	86	9	10	9	112	290
La Roi and Pluth 1986	CF3	50	61	111	76	12	9	15	112	223
La Roi and Pluth 1986	CF9	96	42	138	109	13	12	13	148	286
La Roi and Pluth 1986	FC1	161	204	364	113	18	11	22	164	528
La Roi and Pluth 1986	FC2	117	306	423	105	16	10	20	151	574
La Roi and Pluth 1986	FC3	135	569	704	95	15	10	19	139	843
La Roi and Pluth 1986	FC4	201	57	258	149	26	20	19	214	472
La Roi and Pluth 1986	FC5	59	32	91	140	14	15	14	182	273
La Roi and Pluth 1986	FC6	46	16	63	135	17	16	13	181	244
La Roi and Pluth 1986	HC1	197	17	214	167	26	16	33	243	457
La Roi and Pluth 1986	KN1	24	10	34	23	2	3	3	31	65
La Roi and Pluth 1986	KN10	115	96	211	146	23	14	29	212	423
La Roi and Pluth 1986	KN11	518	107	625	125	18	13	22	178	803
La Roi and Pluth 1986	KN12	40	546	586	85	9	8	13	115	701
La Roi and Pluth 1986	KN13	96	23	119	84	8	9	9	110	229
La Roi and Pluth 1986	KN2	116	8	124	28	3	3	3	37	161
La Roi and Pluth 1986	KN3	125	24	148	112	13	13	12	150	298
La Roi and Pluth 1986	KN4	88	96	183	112	17	13	16	158	341
La Roi and Pluth 1986	KN5	133	8	140	78	8	8	8	103	243
La Roi and Pluth 1986	KN6	78	39	116	107	12	13	10	141	257
La Roi and Pluth 1986	KN7	48	16	64	93	9	10	9	121	185

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
La Roi and Pluth 1986	KN8	49	37	85	75	8	8	7	98	183
La Roi and Pluth 1986	PS11	89	39	128	86	13	11	9	119	247
La Roi and Pluth 1986	PS12	74	19	93	91	13	11	12	126	219
La Roi and Pluth 1986	PS13	70	15	85	67	13	10	6	95	180
La Roi and Pluth 1986	PS14	109	27	136	57	6	7	6	75	211
La Roi and Pluth 1986	PS20	51	55	106	56	6	6	6	75	181
La Roi and Pluth 1986	PS233	373	117	490	120	20	14	19	173	663
La Roi and Pluth 1986	PS241	44	71	115	54	7	6	5	72	187
La Roi and Pluth 1986	PS243	81	26	107	92	11	11	8	122	229
La Roi and Pluth 1986	PS245	68	21	89	62	6	7	7	81	170
La Roi and Pluth 1986	PS246	41	31	71	96	10	11	10	126	197
La Roi and Pluth 1986	PS247	64	26	90	110	15	14	10	149	239
La Roi and Pluth 1986	PS248	67	18	85	88	9	10	9	115	200
La Roi and Pluth 1986	PS249	28	37	66	87	10	10	10	116	182
La Roi and Pluth 1986	PS257	97	281	378	88	14	10	15	128	506
La Roi and Pluth 1986	PS267	142	21	163	111	19	15	12	157	320
La Roi and Pluth 1986	PS6	127	14	141	100	13	12	10	134	275
La Roi and Pluth 1986	PS7	48	20	68	100	16	16	7	139	207
La Roi and Pluth 1986	PS8	49	22	71	95	11	12	8	126	197
La Roi and Pluth 1986	PS9	66	24	90	76	9	9	7	101	191
La Roi and Pluth 1986	SA10	106	22	127	79	8	9	8	103	230
La Roi and Pluth 1986	SA11	110	13	123	87	9	10	8	113	236
La Roi and Pluth 1986	SA12	70	8	78	29	3	3	4	38	116
La Roi and Pluth 1986	SA13	41	447	488	99	13	9	17	139	627
La Roi and Pluth 1986	SA14	72	31	103	67	7	8	7	88	191
La Roi and Pluth 1986	SA15	33	57	90	33	3	4	4	44	134
La Roi and Pluth 1986	SA16	26	16	41	65	7	7	6	85	126
La Roi and Pluth 1986	SA17	65	43	107	84	9	9	11	112	219
La Roi and Pluth 1986	SA19	59	24	83	22	2	2	3	29	112
La Roi and Pluth 1986	SA20	57	21	78	37	4	4	6	50	128
La Roi and Pluth 1986	SA21	237	30	266	111	13	13	12	147	413
La Roi and Pluth 1986	SA22	117	29	147	115	13	13	12	153	300
La Roi and Pluth 1986	SA26	71	48	119	114	12	12	15	152	271
La Roi and Pluth 1986	SA27	17	9	27	17	2	2	2	23	50
La Roi and Pluth 1986	SA3	118	45	163	144	22	16	26	207	370
La Roi and Pluth 1986	SA4	95	507	602	85	13	9	15	123	725
La Roi and Pluth 1986	SA5	134	4	138	92	12	11	12	127	265
La Roi and Pluth 1986	SA50	114	15	129	119	18	14	16	167	296
La Roi and Pluth 1986	SA51	140	68	208	120	18	13	21	171	379

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
La Roi and Pluth 1986	SA52	69	66	136	148	15	16	15	194	330
La Roi and Pluth 1986	SA53	44	19	64	80	8	7	12	107	171
La Roi and Pluth 1986	SA54	35	36	71	58	6	6	6	77	148
La Roi and Pluth 1986	SA55	14	13	27	20	2	2	3	27	54
La Roi and Pluth 1986	SA56	173	28	202	11	1	1	2	15	217
La Roi and Pluth 1986	SA57	22	30	52	67	7	7	8	89	141
La Roi and Pluth 1986	SA58	26	15	41	42	4	5	5	56	97
La Roi and Pluth 1986	SA59	207	107	314	91	9	10	9	119	433
La Roi and Pluth 1986	SA6	91	22	114	162	25	20	20	227	341
La Roi and Pluth 1986	SA60	27	40	68	72	9	11	9	101	169
La Roi and Pluth 1986	SA61	28	43	71	100	10	11	12	133	204
La Roi and Pluth 1986	SA62	42	23	65	145	15	16	15	190	255
La Roi and Pluth 1986	SA63	33	7	40	11	1	1	1	15	55
La Roi and Pluth 1986	SA64	17	20	37	160	16	18	15	209	246
La Roi and Pluth 1986	SA65	140	63	204	78	12	8	15	112	316
La Roi and Pluth 1986	SA67	40	50	90	93	9	10	10	123	213
La Roi and Pluth 1986	SA68	96	15	111	134	15	17	16	182	293
La Roi and Pluth 1986	SA69	179	150	328	96	15	13	18	142	470
La Roi and Pluth 1986	SA7	73	13	86	107	12	11	14	144	230
La Roi and Pluth 1986	SA70	139	30	170	99	17	12	17	144	314
La Roi and Pluth 1986	SA71	122	16	138	91	14	10	15	131	269
La Roi and Pluth 1986	SA72	67	117	184	122	18	14	20	174	358
La Roi and Pluth 1986	SA73	73	109	182	106	18	13	16	153	335
La Roi and Pluth 1986	SA74	53	61	114	94	16	12	13	134	248
La Roi and Pluth 1986	SA75	137	49	186	85	14	10	16	125	311
La Roi and Pluth 1986	SA76	65	77	142	106	11	11	12	140	282
La Roi and Pluth 1986	SA77	80	73	153	69	8	11	9	98	251
La Roi and Pluth 1986	SA78	82	15	97	108	12	12	13	145	242
La Roi and Pluth 1986	SA79	70	23	93	108	12	11	13	144	237
La Roi and Pluth 1986	SA8	32	22	53	42	4	5	4	56	109
La Roi and Pluth 1986	SA80	74	23	97	91	11	9	13	125	222
La Roi and Pluth 1986	SA81	173	27	200	97	15	10	19	140	340
La Roi and Pluth 1986	SA82	151	211	362	129	20	15	21	184	546
La Roi and Pluth 1986	SA83	108	47	155	147	16	16	18	197	352
La Roi and Pluth 1986	SA84	47	43	90	84	13	8	17	122	212
La Roi and Pluth 1986	SA85	37	10	47	115	12	13	12	152	199
La Roi and Pluth 1986	SA86	47	23	71	76	8	8	9	101	172
La Roi and Pluth 1986	SA9	16	17	33	22	2	3	3	29	62
La Roi and Pluth 1986	WF1	29	14	42	40	5	4	5	54	96

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
La Roi and Pluth 1986	WF10	45	60	105	65	8	8	7	88	193
La Roi and Pluth 1986	WF11	30	15	45	67	7	7	8	89	134
La Roi and Pluth 1986	WF2	241	26	267	131	22	14	23	190	457
La Roi and Pluth 1986	WF3	149	75	225	119	19	12	24	173	398
La Roi and Pluth 1986	WF4	67	51	118	105	13	11	16	145	263
La Roi and Pluth 1986	WF5	119	20	139	119	13	15	14	160	299
La Roi and Pluth 1986	WF6	161	85	245	60	9	6	12	87	332
La Roi and Pluth 1986	WF7	287	77	363	55	8	5	10	79	442
La Roi and Pluth 1986	WF8	68	9	77	99	10	11	10	130	207
La Roi and Pluth 1986	WF9	236	58	295	125	20	13	25	182	477
ESIS	67KT2832	35	19	55	18	3	5	2	28	83
ESIS	67KT2833	63	20	83	15	2	2	2	21	104
ESIS	67KT2834	33	72	105	21	3	4	2	30	135
ESIS	67KT2835	29	16	44	22	3	5	2	32	76
ESIS	34CB2460	180	44	225	55	6	9	7	76	301
ESIS	34CB2465	90	25	114	122	13	17	12	163	277
ESIS	34CB4645	91	43	134	47	5	5	6	63	197
ESIS	34CB8565	70	88	157	84	8	9	9	110	267
ESIS	34CB8598	117	46	163	67	7	11	9	94	257
ESIS	34CB8614	212	280	492	68	9	19	13	108	600
ESIS	34CB8616	100	59	159	24	4	10	6	44	203
ESIS	34CB8621	334	44	379	74	10	22	15	120	499
ESIS	34CB8622	172	29	201	25	4	6	7	42	243
ESIS	34ET4448	159	16	176	50	10	10	3	74	250
ESIS	67GC3922	429	0	429	154	16	26	13	209	638
ESIS	67HT4929	204	17	221	106	15	35	22	177	398
ESIS	37KR1029	76	47	123	61	14	12	3	90	213
ESIS	37KR1035	67	12	79	10	2	2	0	14	93
ESIS	37KR1036	216	29	245	104	15	25	3	146	391
ESIS	37KR1037	69	25	94	22	3	5	1	31	125
ESIS	37KR1038	226	28	255	85	17	18	3	122	377
ESIS	37KR1039	106	5	111	36	7	8	1	51	162
ESIS	37KR1045	53	19	72	123	28	24	5	180	252
ESIS	37KR1046	73	42	115	19	4	4	1	27	142
ESIS	37KR1048	85	24	109	82	18	16	3	119	228
ESIS	37KR1136	107	68	175	49	8	5	10	72	247
ESIS	67FL1725	0	610	610	9	1	2	2	13	623
ESIS	67FL1726	217	248	465	40	7	6	5	57	522
ESIS	67FL1727	0	686	686	0	0	0	0	0	686

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ESIS	67FL1731	74	60	134	64	5	3	4	76	210
ESIS	67FL1732	0	958	958	8	1	2	1	12	970
ESIS	67FL1733	25	12	37	67	5	4	4	81	118
ESIS	67FL1737	74	141	215	3	1	0	1	5	220
ESIS	67FL1738	126	372	498	35	6	5	6	53	551
ESIS	67FL2739	197	223	420	44	7	4	9	64	484
ESIS	67FL2740	99	99	198	82	7	4	5	98	296
ESIS	67FL2741	79	49	128	84	7	5	6	102	230
ESIS	67FL2743	153	51	204	82	15	11	11	119	323
ESIS	67FL2744	66	502	568	44	6	9	5	65	633
ESIS	67FL2745	14	28	42	79	8	6	5	98	140
ESIS	67FL2746	112	53	165	81	18	15	4	118	283
ESIS	67FL2747	183	128	312	49	8	5	10	71	383
ESIS	67FL2749	88	92	180	29	5	3	7	44	224
ESIS	67FL2753	91	59	150	39	5	4	6	54	204
ESIS	67FL2755	137	59	196	72	8	5	9	94	290
ESIS	67FL2757	155	62	217	65	11	8	11	96	313
ESIS	67FL2758	37	468	506	62	10	7	11	89	595
ESIS	67FL3702	343	120	463	95	15	9	19	139	602
ESIS	67FL3703	179	146	325	47	9	5	10	71	396
ESIS	67FL3706	151	87	238	146	24	16	25	211	449
ESIS	67CS1823	88	5	93	22	2	1	2	26	119
ESIS	67CS1824	40	20	60	66	10	6	13	96	156
ESIS	67CS1825	41	20	61	36	3	3	3	44	105
ESIS	67CS1826	69	8	77	35	3	2	2	43	120
ESIS	67CS1828	29	20	49	21	2	2	1	25	74
ESIS	67CS1829	38	17	55	29	2	2	2	35	90
ESIS	67CS1822	33	68	101	19	2	2	4	27	128
ARNEWS	PLOT 905	222	4	226	24	4	8	6	43	269
ARNEWS	PLOT 906	37	6	43	31	5	10	5	51	94
ARNEWS	PLOT 907	142	22	165	49	6	12	7	74	239
ARNEWS	PLOT 915	242	9	251	68	8	13	9	98	349
ARNEWS	PLOT 901	231	7	238	25	4	4	2	35	273
ARNEWS	PLOT 902	247	32	279	71	10	11	5	96	375
ARNEWS	PLOT 903	148	7	155	48	8	6	4	65	220
ARNEWS	PLOT 904	340	6	346	58	10	7	4	79	425
ARNEWS	PLOT 908	144	51	195	65	9	16	10	100	295
ARNEWS	PLOT 911	185	7	191	74	12	9	5	100	291
ARNEWS	PLOT 912	959	14	973	34	6	8	5	54	1027

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ARNEWS	PLOT 913	555	23	578	34	6	10	6	56	634
ARNEWS	**PLOT 914**	**676**	**114**	**790**	**28**	**5**	**10**	**8**	**50**	**840**
Knapik et al. 1988	Plot 12	66	0	66	8	2	3	2	15	81
Knapik et al. 1988	**Plot 13**	**59**	**21**	**80**	**8**	**2**	**3**	**2**	**15**	**95**
Knapik et al. 1988	Plot 22	63	45	108	27	5	5	2	39	147
Knapik et al. 1988	**Plot 23**	**83**	**72**	**155**	**74**	**7**	**16**	**3**	**100**	**255**
Knapik et al. 1988	Plot 25	90	59	149	48	10	8	2	68	217
Knapik et al. 1988	**Plot 36**	**75**	**59**	**134**	**79**	**11**	**6**	**16**	**112**	**246**
Knapik et al. 1988	Plot 37	71	99	170	48	10	8	2	68	238
Knapik et al. 1988	**Plot 51**	**65**	**27**	**92**	**9**	**2**	**3**	**2**	**16**	**108**
Knapik et al. 1988	Plot 52	83	21	104	8	2	3	2	14	118
Knapik et al. 1988	**Plot 60**	**172**	**55**	**227**	**52**	**11**	**9**	**2**	**74**	**301**
Knapik et al. 1988	Plot 66	73	66	139	32	5	6	2	45	184
Knapik et al. 1988	**Plot 7**	**77**	**28**	**105**	**49**	**7**	**9**	**3**	**68**	**173**
Knapik et al. 1988	Plot 71	114	35	149	46	6	5	8	65	214
Knapik et al. 1988	**Plot 90**	**78**	**49**	**127**	**81**	**17**	**14**	**3**	**116**	**243**
Knapik et al. 1988	Plot 95	66	15	81	65	14	11	3	92	173
ARNEWS	**PLOT 818**	**450**	**22**	**472**	**16**	**3**	**3**	**1**	**23**	**495**
Halliwell and Apps 1997	MAN AIH-14 (1)	117	43	159	27	6	5	1	38	197
Halliwell and Apps 1997	**MAN AIH-30 (1)**	**147**	**24**	**171**	**13**	**3**	**2**	**1**	**19**	**190**
Halliwell and Apps 1997	MAN AIM-1 (1)	64	92	156	4	1	1	0	6	162
Halliwell and Apps 1997	**MAN AIM-20 (1)**	**271**	**7**	**278**	**7**	**1**	**1**	**0**	**9**	**287**
Halliwell and Apps 1997	MAN BDH-3a (1)	109	97	206	3	0	0	1	4	210
Halliwell and Apps 1997	**MAN BDH-3b (2)**	**101**	**68**	**169**	**4**	**0**	**0**	**1**	**5**	**174**
Halliwell and Apps 1997	MAN BIH-1a (1)	63	23	86	22	3	3	4	32	118
Halliwell and Apps 1997	**MAN BIH-1b (2)**	**106**	**302**	**408**	**27**	**3**	**2**	**5**	**36**	**444**
Halliwell and Apps 1997	MAN BIH-1c (3)	93	130	223	14	2	1	3	20	243
Halliwell and Apps 1997	**MAN BIH-9 (1)**	**78**	**28**	**106**	**25**	**3**	**2**	**4**	**35**	**141**
Halliwell and Apps 1997	MAN BIL-2 (1)	29	371	399	3	0	0	1	5	404
Halliwell and Apps 1997	**MAN BIM-12a (1)**	**107**	**139**	**246**	**25**	**3**	**2**	**5**	**34**	**280**
Halliwell and Apps 1997	MAN BIM-1a	69	30	98	25	3	2	5	35	133
Halliwell and Apps 1997	**MAN BIM-1b (2)**	**100**	**103**	**203**	**33**	**4**	**3**	**6**	**46**	**249**
Halliwell and Apps 1997	MAN BMH-6 (1)	68	66	134	25	3	2	4	34	168
Halliwell and Apps 1997	**MAN BMH-7 (1)**	**102**	**127**	**229**	**53**	**6**	**4**	**10**	**73**	**302**
Halliwell and Apps 1997	MAN BML-21 (1)	437	184	620	5	1	0	1	7	627
Halliwell and Apps 1997	**MAN BMM-8a (1)**	**73**	**103**	**176**	**39**	**5**	**4**	**6**	**54**	**230**
Halliwell and Apps 1997	MAN BMM-8b (2)	83	243	326	9	1	1	2	12	338
Halliwell and Apps 1997	**MAN JDH-3 (1)**	**16**	**36**	**52**	**4**	**1**	**2**	**1**	**8**	**60**
Halliwell and Apps 1997	MAN JDM-1 (1)	40	11	51	1	1	1	1	4	55

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
Halliwell and Apps 1997	MAN JIH-2 (1)	35	19	54	14	2	3	2	20	74
Halliwell and Apps 1997	MAN JIL-1 (1)	21	17	38	17	2	3	1	22	60
Halliwell and Apps 1997	MAN JIM-4 (1)	21	13	34	12	3	4	2	21	55
Halliwell and Apps 1997	MAN MW-1a (1)	94	26	120	25	4	3	3	35	155
Halliwell and Apps 1997	MAN MW-2a (1)	92	33	125	31	3	3	5	42	167
Halliwell and Apps 1997	MAN P-AM-1 (1)	377	17	394	45	9	8	2	63	457
Halliwell and Apps 1997	MAN P-JM-1 (1)	375	16	391	51	8	8	2	69	460
Halliwell and Apps 1997	MAN S-AD-1 (1)	339	18	357	7	2	2	1	12	369
Halliwell and Apps 1997	MAN SO-M-1 (1)	334	22	356	17	3	4	2	26	382
Halliwell and Apps 1997	MAN T-AM-1 (1)	166	12	177	43	9	7	2	62	239
Halliwell and Apps 1997	MAN T-BI-1 (1)	334	33	367	40	4	3	7	55	422
Halliwell and Apps 1997	MAN TE-OA (1)	285	21	306	38	8	7	1	54	360
Halliwell and Apps 1997	MAN TE-OBS (1)	0	102	102	30	3	3	5	41	143
Halliwell and Apps 1997	MAN TE-OJP (1)	47	13	60	21	4	6	3	33	93
Knapik et al. 1989	Plot 8802	55	5	59	20	3	4	2	29	88
Knapik et al. 1989	Plot 8808	122	49	171	115	25	15	5	161	332
Knapik et al. 1989	Plot 8810	49	32	81	91	8	4	14	117	198
Knapik et al. 1989	Plot 8815	81	16	98	34	4	6	3	47	145
Knapik et al. 1989	Plot 8824	44	472	516	35	4	5	7	50	566
Knapik et al. 1989	Plot 8829	39	2	41	11	2	3	1	17	58
Knapik et al. 1989	Plot 8832	47	20	67	8	2	3	1	14	81
Knapik et al. 1989	Plot 8835	66	8	74	23	3	5	2	33	107
Knapik et al. 1989	Plot 8836	63	0	63	9	2	3	1	15	78
Knapik et al. 1989	Plot 8837	62	10	72	22	3	4	2	32	104
Knapik et al. 1989	Plot 8838	61	276	337	37	4	5	7	53	390
Halliwell and Apps 1997	MAN G-BI-1 (1)	188	27	215	28	3	2	5	38	253
Halliwell and Apps 1997	MAN G-BI-2 (1)	156	24	180	25	3	2	5	34	214
ARNEWS	PLOT 204	68	33	102	61	4	7	3	76	178
ARNEWS	PLOT 216	306	41	347	38	6	10	5	59	406
ARNEWS	PLOT 217	405	79	484	54	9	14	9	86	570
ARNEWS	PLOT 218	586	25	610	36	7	12	2	57	667
ARNEWS	PLOT 219	575	22	597	36	5	8	2	50	647
ARNEWS	PLOT 224	361	26	387	61	8	44	5	118	505
ARNEWS	PLOT 209	199	39	237	58	8	10	7	83	320
ARNEWS	PLOT 210	208	56	264	54	7	10	4	76	340
ARNEWS	PLOT 211	150	23	173	42	5	6	2	55	228
ARNEWS	PLOT 212	274	21	295	31	5	11	4	51	346
ARNEWS	PLOT 213	324	33	356	27	3	7	3	39	395
ARNEWS	PLOT 214	169	60	229	33	5	8	3	49	278

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ARNEWS	PLOT 215	748	31	779	55	7	14	9	84	863
ARNEWS	**PLOT 221**	**596**	**27**	**624**	**34**	**5**	**9**	**6**	**53**	**677**
ARNEWS	PLOT 222	345	26	371	32	5	8	1	47	418
ARNEWS	**PLOT 223**	**661**	**12**	**673**	**32**	**5**	**9**	**1**	**47**	**720**
Kingston et al. 1995	Dickey Lake Road	146	16	162	72	12	29	4	117	279
Kingston et al. 1995	**McIntyres Mountain**	**157**	**54**	**211**	**83**	**16**	**41**	**6**	**145**	**356**
Kingston et al. 1995	West Brook Road	347	62	409	105	16	61	36	218	627
Kingston et al. 1995	**West River Station**	**240**	**28**	**268**	**67**	**20**	**33**	**11**	**122**	**390**
ARNEWS	PLOT 816	111	43	154	64	13	12	4	93	247
ARNEWS	**PLOT 817**	**205**	**19**	**224**	**50**	**8**	**5**	**9**	**73**	**297**
ARNEWS	PLOT 502	34	348	382	31	4	3	6	43	425
ARNEWS	**PLOT 503**	**167**	**33**	**200**	**31**	**5**	**8**	**1**	**45**	**245**
ARNEWS	PLOT 504	599	22	621	59	9	13	4	84	705
ARNEWS	**PLOT 505**	**672**	**20**	**692**	**99**	**13**	**36**	**3**	**150**	**842**
ARNEWS	PLOT 509	162	78	240	23	2	1	2	28	268
ARNEWS	**PLOT 510**	**229**	**44**	**273**	**33**	**3**	**3**	**6**	**44**	**317**
ARNEWS	PLOT 511	173	48	221	23	3	5	4	36	257
ARNEWS	**PLOT 512**	**83**	**7**	**90**	**59**	**5**	**3**	**4**	**71**	**161**
ARNEWS	PLOT 513	140	48	188	35	3	2	5	45	233
ARNEWS	**PLOT 514**	**276**	**9**	**285**	**6**	**1**	**2**	**3**	**13**	**298**
ARNEWS	PLOT 515	273	7	280	20	2	3	2	27	307
ARNEWS	**PLOT 516**	**136**	**24**	**160**	**42**	**9**	**7**	**2**	**59**	**219**
ARNEWS	PLOT 520	82	13	95	26	5	4	1	37	132
ARNEWS	**PLOT 521**	**49**	**40**	**89**	**12**	**1**	**1**	**1**	**15**	**104**
ARNEWS	PLOT 522	49	33	83	22	2	1	2	26	109
ARNEWS	**PLOT 523**	**55**	**16**	**72**	**14**	**2**	**1**	**2**	**18**	**90**
ARNEWS	PLOT 524	71	45	116	32	3	2	2	39	155
ARNEWS	**PLOT 527**	**246**	**11**	**258**	**46**	**8**	**21**	**2**	**76**	**334**
ARNEWS	PLOT 528	294	54	348	33	6	14	2	54	402
ARNEWS	**PLOT 529**	**118**	**40**	**157**	**26**	**4**	**4**	**1**	**35**	**192**
ARNEWS	PLOT 530	88	57	145	46	5	4	8	63	208
ARNEWS	**PLOT 531**	**157**	**24**	**181**	**34**	**6**	**5**	**2**	**46**	**227**
ARNEWS	PLOT 532	78	81	159	44	9	8	2	63	222
ARNEWS	**PLOT 533**	**214**	**30**	**244**	**46**	**8**	**8**	**3**	**65**	**309**
ARNEWS	PLOT 534	37	33	70	41	9	7	1	58	128
ARNEWS	**PLOT 535**	**376**	**33**	**409**	**10**	**2**	**2**	**0**	**14**	**423**
ARNEWS	PLOT 536	92	27	119	25	2	1	2	30	149
ARNEWS	**PLOT 537**	**397**	**28**	**425**	**23**	**4**	**4**	**1**	**32**	**457**
ARNEWS	PLOT 538	502	10	512	37	8	6	1	53	565

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
ARNEWS	PLOT 506	162	20	182	67	6	25	2	100	282
ARNEWS	PLOT 507	286	6	292	107	10	40	3	161	453
ARNEWS	PLOT 508	367	12	379	88	8	33	3	132	511
ARNEWS	PLOT 517	153	22	175	23	3	5	2	32	207
ARNEWS	PLOT 518	180	7	186	17	3	4	1	24	210
ARNEWS	PLOT 519	615	7	622	46	6	30	12	94	716
ARNEWS	PLOT 525	216	4	220	53	5	20	2	79	299
ARNEWS	PLOT 526	173	10	183	45	8	21	2	75	258
ARNEWS	PLOT 220	253	9	263	40	6	36	7	88	351
ARNEWS	PLOT 313	195	19	214	49	7	12	1	69	283
ARNEWS	PLOT 315	199	23	222	117	13	22	2	153	375
ARNEWS	PLOT 319	149	60	209	59	8	10	1	78	287
ARNEWS	PLOT 320	137	74	210	52	8	16	4	80	290
ARNEWS	PLOT 321	221	69	289	42	7	14	5	67	356
ARNEWS	PLOT 322	360	22	382	76	9	15	1	101	483
ARNEWS	PLOT 324	40	18	59	17	2	4	2	25	84
ARNEWS	PLOT 325	508	52	561	25	4	9	5	42	603
ARNEWS	PLOT 326	269	68	337	15	2	3	2	22	359
ARNEWS	PLOT 301	262	27	289	61	8	20	2	92	381
ARNEWS	PLOT 302	280	19	299	43	4	14	1	62	361
ARNEWS	PLOT 303	144	46	190	48	7	12	4	71	261
ARNEWS	PLOT 304	169	65	234	41	6	8	4	58	292
ARNEWS	PLOT 305	112	39	151	25	4	5	3	35	186
ARNEWS	PLOT 306	218	36	254	115	14	44	6	179	433
ARNEWS	PLOT 307	155	57	212	51	7	16	4	77	289
ARNEWS	PLOT 314	226	23	248	55	8	17	2	81	329
ARNEWS	PLOT 316	238	59	297	28	3	2	5	38	335
ARNEWS	PLOT 317	242	45	287	36	4	4	7	51	338
ARNEWS	PLOT 308	415	7	423	76	13	34	3	126	549
ARNEWS	PLOT 312	188	10	199	89	12	39	3	142	341
ARNEWS	PLOT 819	73	48	121	54	11	8	5	78	199
Halliwell and Apps 1997	SASK ADH-2 (1)	68	38	106	15	3	3	1	21	127
Halliwell and Apps 1997	SASK ADM-3(1)	118	18	136	5	1	1	0	7	143
Halliwell and Apps 1997	SASK AIH-3 (1)	51	37	87	44	9	7	2	63	150
Halliwell and Apps 1997	SASK AIM-13 (1)	52	34	86	38	8	7	1	53	139
Halliwell and Apps 1997	SASK AMH-16 (1)	50	32	82	35	8	6	1	50	132
Halliwell and Apps 1997	SASK AMM-12 (1)	38	20	58	55	11	10	2	78	136
Halliwell and Apps 1997	SASK B?L (1)	0	186	186	9	1	2	2	13	199
Halliwell and Apps 1997	SASK B-AM-1 (1)	56	25	81	8	2	1	0	12	93

Appendix 3B. Continued

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
Halliwell and Apps 1997	SASK BDH-4 (2)	0	467	467	2	1	2	1	6	473
Halliwell and Apps 1997	SASK BDL-20 (1)	78	141	220	30	3	2	5	40	260
Halliwell and Apps 1997	SASK BIH (1)	147	28	176	15	2	1	2	20	196
Halliwell and Apps 1997	SASK BMH (2)	37	31	68	62	6	7	7	82	150
Halliwell and Apps 1997	SASK BMH-9 (1)	0	597	597	43	5	4	7	59	656
Halliwell and Apps 1997	SASK BMM-1b (2)	143	140	283	29	3	3	5	39	322
Halliwell and Apps 1997	SASK Jail House(1)	51	11	62	66	14	11	4	95	157
Halliwell and Apps 1997	SASK JDM-8 (1)	16	44	61	3	1	1	1	6	67
Halliwell and Apps 1997	SASK JIH-7 (1)	35	22	57	24	4	6	4	38	95
Halliwell and Apps 1997	SASK JMH-10 (1)	10	18	28	40	5	6	3	53	81
Halliwell and Apps 1997	SASK JMH-5 (1)	42	31	73	52	6	5	8	70	143
Halliwell and Apps 1997	SASK JMH-A1 (1)	38	21	59	48	6	6	6	66	125
Halliwell and Apps 1997	SASK JMH-A2 (2)	40	28	68	51	7	6	6	70	138
Halliwell and Apps 1997	SASK JMM-5 (1)	34	2	36	38	4	6	3	51	87
Halliwell and Apps 1997	SASK JMM-6 (1)	20	26	46	29	3	4	2	38	84
Halliwell and Apps 1997	SASK JMM-8a (1)	10	12	22	25	3	4	2	33	55
Halliwell and Apps 1997	SASK JMM-8b (2)	11	11	22	37	5	7	3	53	75
Halliwell and Apps 1997	SASK M-BD-1 (1)	0	211	211	3	0	0	1	4	215
Halliwell and Apps 1997	SASK MW-1a (1)	98	48	145	73	14	15	10	112	257
Halliwell and Apps 1997	SASK MW-1b (2)	98	34	132	53	8	6	9	76	208
Halliwell and Apps 1997	SASK NI-J-1 (1)	55	44	99	8	2	3	1	14	113
Halliwell and Apps 1997	SASK PA-BM-1(1)	84	45	129	62	8	6	10	85	214
Halliwell and Apps 1997	SASK PA-M-1 (1)	97	31	129	68	13	10	7	98	227
Halliwell and Apps 1997	SASK PA-M-2 (1)	56	23	78	32	7	5	1	45	123
Halliwell and Apps 1997	SASK POM-MW (1)	49	21	70	59	13	10	3	84	154
Halliwell and Apps 1997	SASK POM-OBS (1)	349	210	559	53	6	5	9	72	631
Halliwell and Apps 1997	SASK POM-OJP (1)	127	20	147	62	7	8	4	81	228
Halliwell and Apps 1997	SASK TE MW (1)	104	24	129	29	6	5	2	42	171
Halliwell and Apps 1997	SASK TE-OA (1)	97	28	125	32	7	6	1	46	171
Halliwell and Apps 1997	SASK TE-OBS (1)	61	44	106	26	3	3	5	36	142
Halliwell and Apps 1997	SASK TE-OJP (1)	37	11	47	21	3	4	2	30	77
Halliwell and Apps 1997	SASK TF-YA (1)	167	34	201	2	1	1	0	3	204
Halliwell and Apps 1997	SASK TF-YJP (1)	57	12	69	6	2	3	2	13	82
Halliwell and Apps 1997	SASK F-AM-1 (1)	142	28	170	48	10	8	2	68	238
Halliwell and Apps 1997	SASK F-BD-1 (1)	70	30	100	14	2	1	2	19	119
Halliwell and Apps 1997	SASK F-BI-1 (1)	251	21	272	18	2	2	3	25	297
Halliwell and Apps 1997	SASK F-BM-1 (1)	273	318	591	41	4	3	7	56	647
Halliwell and Apps 1997	SASK F-BM-2 (1)	34	14	48	16	2	3	3	23	71
Halliwell and Apps 1997	SASK F-BM-3 (1)	256	23	279	22	2	2	3	29	308

Appendix 3B. Concluded

Original source[a]	Original source ID	Mineral soil carbon	Organic soil carbon	Total soil carbon	Stem wood carbon	Stem bark carbon	Branch carbon	Foliage carbon	Total live tree carbon[b]	Total ecosystem carbon[b]
Halliwell and Apps 1997	SASK F-JD-1 (1)	87	18	105	4	2	3	1	9	114
Halliwell and Apps 1997	SASK F-JM-1 (1)	58	28	86	32	4	4	4	43	129
Halliwell and Apps 1997	SASK F-JM-2 (1)	71	14	85	27	3	5	3	38	123
Halliwell and Apps 1997	SASK F-JM-4 (1)	0	50	50	17	2	3	3	25	75
Halliwell and Apps 1997	SASK F-JM-5 (1)	225	22	246	23	3	3	4	32	278
Halliwell and Apps 1997	SASK F-M-1 (1)	200	24	224	25	3	4	2	34	258

[a] ARNEWS = Acid Rain Early Warning System (D'Eon 1994), ESIS = Alberta Ecological Sita Data (Resource Data Branch 2002).

[b] Totals may differ slightly from sum of components because of rounding.

[c] Data appears in the order produced by ACCESS.